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A RECENT note in this column criticizing a convention practice of the Railway Signal Association has brought replies. One is from a manufacturer, distinguished for his knowledge of the science and art of signaling; one who did as much as any, possibly more, to organize the association and guide it to channels of usefulness. Apparently he thinks we are wrong in objecting to reading at conventions, discussing and printing in the formal report proprietors' descriptions of proprietary signal devices—this to the necessary expulsion of discussions of important topics in the programme. Aside from the question of right or wrong, he thinks we were savage in expression of disapproval, in which he is quite right. The association's past

president writes that, prompted by our editorial, he put in his annual address last week the following paragraph:

"This association membership carefully avoids in specifications, mention of a proprietary name, and the association, by direction, excludes it. It is questionable whether freer discussion cannot be had by naming and discussing proprietary articles, thereby hastening the development of some new plan or scheme."

He has excellent support in this idea. Mr. Vaughan, president of the Master Car Builders' Association, told the convention a year ago to use the well-known names in all the discussions. He set the example and it was followed. Members have nothing to fear in this or in proper relations with designers and makers whose broad knowledge of the requirements under varying conditions qualifies many of them as expert advisers. It is objectionable, however, as we have pointed out, to read at convention and print in the proceedings proprietors' descriptions. They are out of place. It wastes the convention's precious time. The officers of this spirited young association can learn much by observing the methods and practices finally arrived at by the older engineering organizations.

THE annual convention of the Railway Signal Association at Richmond, Va., last week, was highly successful. No exciting topics were up for discussion, but there were plenty which were important, though not exciting. Dealing with the minute details of a half-dozen codes of specifications is no easy matter in a large meeting, as has been shown in past years; but in this case President Balliet kept the speakers within bounds and the time schedule was closely adhered to. The old mistake of letting a hundred men spend hours on committee work, which could be better done by a half-dozen, was not repeated. The successive years' work have brought the several codes of specifications into better shape and there is not so much temptation to pick them to pieces. The specifications reported this year are so voluminous that we are unable to reprint them, and we must ask those who read our report of the meeting to do so with the committee reports before them. The most notable committee reports being those on electric railway signaling and on signal literature, were not discussed, and under the circumstances were not susceptible of discussion. The first makes a valuable chapter of history, such recent history that we are liable not to realize its importance; and the second is a most useful work which has long waited to be done. The association is not rich, and the workers who got up this valuable index will have their recompense in the thanks of the railway world.

IN the October 13 issue of the *Independent* there is an article by Harrison S. Smalley on the question of "Should Railway Rates be Increased?" Mr. Smalley is assistant professor of political economy in the University of Michigan, in which university Henry C. Adams is professor of political economy. Unlike so many theoretical discussions of the rate question, the errors in this article are so definite that it is possible to definitely correct them. Mr. Smalley says: "The conclusion reached by railway advocates [that since within the last 10 years or so wages, prices and the like have advanced, the cost to a railway of furnishing its services has also increased] is altogether erroneous. It is erroneous because it is reached only by ignoring an element which is vital in the case. * * * This element in determining the cost of railway services * * * is the volume or density of traffic. *While expenses have decidedly increased, traffic has also increased in even greater proportion, with the result that the expense of furnishing railway services has actually diminished.*" The italics are Mr. Smalley's own. To prove this, Mr. Smalley compares the years 1897 and 1907. He says that he uses these two years because railway men themselves, meaning, apparently, C. C. McCain in his pamphlet on "The Diminished Purchasing Power of Railway Earnings," have taken these years. It is entirely improper to take 1907 into consideration at all. The question is a question of earnings and expenses in 1910; moreover, 1897 was an abnormal year, and 1898 would be a better year for a fair comparison with 1910.

Mr. Smalley's figures in support of his contention are as follows: "Between 1897 and 1907, while railway mileage expanded 25 per cent. and the total expenses of all railway companies were augmented 106 per cent., passenger traffic increased 126 per cent., from 12,256,939,647 to 27,718,554,030 passenger miles; and freight traffic grew 149 per cent., from 95,139,022,225 to 236,601,390,103 ton miles." It means very little to take average figures for the whole country in a case like this. For instance, to lump together a mile of road of the Pennsylvania and a mile of Texas line, and divide by two, gives a meaningless average, especially when in 1897 each road had a different way of making up these figures. Taking at random two roads that have made their annual reports for 1910, both of which are considered more prosperous than the average, we find that the Louisville & Nashville expenses per mile of road in 1898 were \$4,994, and the expenses per mile of road in 1910 were \$7,682. This is an increase of \$2,688 per mile, or 54 per cent. The freight density, that is, the number of tons carried one mile per mile of road, was 746,575 tons in 1898 and 1,124,001 tons in 1910. This is an increase in freight density of 377,426 tons, or 51 per cent., comparing with an increase in operating expenses per mile of 54 per cent. The Baltimore & Ohio makes an even more striking showing. Operating expenses on the Baltimore & Ohio amounted to \$10,108 per mile of road in 1898 and \$13,831 per mile in 1910. This is an increase of \$3,723, or 37 per cent. Freight density, on the other hand, was 2,135,214 tons carried one mile per mile of road in 1898 and 2,712,581 tons carried one mile per mile of road in 1910. This is an increase of 577,367 tons, or 27 per cent. Mr. Smalley talks about freight density and passenger density, but when he comes to give the figures he does not give figures for density at all; that is, tons carried one mile per mile of road, but gives gross ton mileage and passenger mileage and per cent. of increase of mileage, leaving the reader to unconsciously make a comparison of unweighted averages.

STEAM AUXILIARIES FOR PASSENGER SERVICE.

IN marine engineering the boilers for passenger liners are proportioned for a production of steam considerably in excess of that required for the main engines, in order to provide for auxiliary engines at the winches, pumps and ventilating fans, and for those of the electric generators for lighting, heating and power.

The requirements of modern passenger car service include almost as many kinds of auxiliaries, which in one form or another are a constant drain on the locomotive boiler. The steam consumption of these auxiliaries is becoming so large that it is important to take account of it in considering questions relating to locomotive economy and capacity. It is also important to investigate the numerous ways in which the economy of the auxiliaries themselves may be unfavorably affected.

The fixtures to be considered in this connection are the air pump and those auxiliaries used in electric lighting, steam heating and ventilating. All those internal fixtures which increase steam consumption, either directly or by increased train resistance, may properly be included. The application of heat in producing useful results in all these fixtures is so indirect that the efficiency is low; it is difficult to say how low it is in each case, for it has rarely been measured. The leakage of air brake pipes and valves is often so great that it requires the constant operation of the pump, and the maximum consumption of steam from this source may be estimated from results of tests which show that with the ordinary pumps 3 cu. ft. of air are compressed to 70 lbs. with 1 lb. of steam. The 11-in. pump uses an equivalent of 3 1-3 lbs. of coal per minute, or 200 lbs. per hour, when required to keep up pressure on a leaky train line. The 9½-in. pump uses an equivalent of 2½ lbs. of coal per minute, and if two pumps are used, as in current practice, the coal required for constant use is 5 lbs. per minute, or 300 lbs. per hour, or approximately 75 h.p. This may represent maximum conditions, but pumps depreciate rapidly and piston packings leak,

so that the efficiency soon drops below that of test conditions with a new pump or one newly repaired.

With two 16 or 18-in. brake cylinders used per passenger car, as now proposed for heavy cars, the air consumption per stop will be considerably increased and the extent of the leakage with a 100-car freight train will call for large volumes of air and a heavy draft of steam from the boiler.

Where there is such a large consumption of steam outside the main engine of a locomotive, it should be occasionally measured so that the amount may be definitely known and the causes of waste detected. The compound air pump has not been used very extensively in the past, but where large volumes of compressed air are required it is not good economy to compress it in a simple pump, and compounding is the most promising method of reducing steam consumption with the air brake system. The economical use of the exhaust from large air pumps is a subject which has not been properly settled. With recently improved devices it can be utilized in the heating system, but it is more frequently introduced into the stack, thus stimulating the wasteful burning of fuel while the locomotive is standing.

The steam consumption for electric lighting of passenger cars is not even approximately known, and comparisons of the cost of operating the different systems are usually incomplete in this particular. For the head-end system, using the steam turbine, it is possible to get a clear estimate of the steam consumption by condensing the exhaust. These turbo-generators consume about 100 lbs. of steam per kilowatt hour, or a total of about 60 h.p. With axle lighting it is not possible to measure the amount of steam used to overcome the increased train resistance, though some approximate estimate can be made by measurements of power absorbed by the generator. With both these systems there is the weight of the small batteries and equipment as a constant charge, causing increased train resistance. With straight battery lighting there is a still larger charge; the heavy weight of the batteries and the cost of hauling them at high speed is much greater than is generally realized. The uncertainties connected with the cost of operating train-lighting plants were plainly brought out at the recent meeting of the Railway Electrical Engineers, when estimates of the cost of hauling batteries varied from 1 mill to 7 mills per ton mile, and, as the latter is about the average cost of hauling freight at slow speed, it is evident that the charge for hauling batteries on high-speed trains should be considerably more than the highest figure suggested. This is of sufficient importance to warrant a careful investigation of the subject so that a proper charge may be made against battery lighting, and its share in the increased steam consumption be more definitely known.

Steam heating of passenger trains has been in the past a heavy drain on the locomotive boiler, though improved traps and greater care in operation have reduced the waste which attended almost all heating systems. The improvements in ventilation, however, are requiring such frequent changes of air that the condensation in the pipes must be considerably increased. With one system in which fresh cold air is forced into the car at the rate of 60,000 cu. ft. per hour the condensation in the radiating pipes is equivalent to 150 h.p. for a train of 10 cars. When the change of air is made more rapidly, as in the deck exhaust system, the steam requirement is even greater. If we assume the following as maximum figures, we may take the steam requirements for air brakes at 75 h.p.; for electric lighting, 60 h.p.; heating and ventilating, 150 h.p. We have a total of 285 h.p. for a 10-car passenger train, which may easily be increased to 300 h.p. on account of external condensation in cold weather. This will call for the combustion of 1,200 to 1,500 lbs. of coal per hour at the very time in winter when train resistance and radiation from the boiler are at a maximum. The steam and electrical auxiliaries connected with passenger train service are thus of sufficient importance to warrant an investigation by a committee of the Master Mechanics' association of their extent and the possible economies that may be effected in their use.

THE STREET RAILWAY CONVENTION.

THE street railway convention held last week at Atlantic City consisted, as usual, of meetings of four separate associations: accountants, engineers (civil and mechanical), claim agents, and transportation and traffic men. It is, of course, quite out of the question to pass even in brief review the work that was done by each of these separate associations, extending from two days to a week. From that done in the three associations outside of the engineering, it is evident that the questions arising for solution are closely parallel to those obtaining on steam railways, in so far as they have to do with the discipline of their employees, the enlistment of their interest and loyalty, and the general relations to the public.

In the engineering department the problems are modifications of those that obtain in steam railway work. In grappling with these the first characteristic in the methods that will attract the attention of an outsider will be the strong tendency toward standardization that permeates everything. It seems as though the general conception of a millennium in things mechanical and structural was the establishment of a standard that is to solve all troubles and make work easy and cheap. No one really thinks this; it is merely the impression conveyed by an observance of what appears to be a feverish haste to one accustomed to the deliberation and caution exercised by the Master Mechanics' and the Master Car Builders' associations; a caution that now exists because it has been forced by experience and which was equally forced in the early days by the impossibility of drawing a majority of the members into agreement.

It is all right to establish standards, and standards when once adopted should not be of that Medes and Persians character that cannot be changed. But to adopt a standard at one convention, criticize it as unsatisfactory at the next, and call for a change at the one following—this tends to belittle its value in the eyes of its users and such of the public as know anything about it, as well as to cast discredit on the promoters of the standard itself. It has been found, too, in the experience of the older associations, that in drawing up specifications it is well to be explicit, but not too much so. We have found that it is well not to pin a manufacturer down too closely, especially in the matter of the chemical composition of materials, because the very limitations so imposed will make for a relief from responsibility as to the quality of the goods delivered. This is a little item of experience that the street railway men seem to have overlooked.

In dealing with the matter of axles a recommendation has been made that a heat-treated axle shall be produced for use in heavy traffic. From the personnel of the committee having the matter in charge it is fair to infer that the Interborough Rapid Transit, of New York, has found the ordinary axle unsatisfactory, and so called in the representatives of the several steel companies making a heat-treated axle for consultation and advice, and that these representatives have agreed to furnish the axle called for in the specifications. This assumption is made because of the composition of the committee, which consisted of two representatives of the Interborough, two from the Midvale Steel Co., and one each from the Bethlehem Steel Co., the Cambria Steel Co. and the Carnegie Steel Co. The agreement is that the steel shall have an ultimate strength of 85,000 lbs., an elastic limit of 50,000 lbs., shall have a contraction of area at point of fracture of a test piece of 45 per cent, and an elongation of 22 per cent. in 2 in.; this with the usual provision of protection in the way of good workmanship and analyses to see that the phosphorus does not rise above .04 per cent. It is also tacitly understood, although the understanding is given no expression in the report, that "heat treatment" is to consist of a hardening in oil with a subsequent drawing. Apparently the distinct agreement as to this matter must be made by the consumer with each contractor, and must be done to insure protection. A case is on record where a manufacturer agreed to give a certain lot of axles a heat treatment. That treatment consisted, when the axle left the hammer, of throwing it down

and covering it with a piece of sheet iron and allowing it to cool as it might under that protection.

In the discussion pending the reference of this specification to the standardization committee a matter cropped up that may be of vital moment to the proper conduct of the meeting.

According to the constitution the associate membership is admitted through rather widely open doors. Those eligible to this membership are "individuals, co-partnerships and corporations who are actively identified with street and interurban railway interests, and other persons who, in the opinion of the executive committee, have had experience of such a nature as to render desirable their connection with the association." This is in such marked contrast to the recent action of the Master Car Builders' Association, in expelling all of their active members who are engaged in trade and in carefully scrutinizing their associate list, as to warrant some comment. Further than this it is a rule which has always been rigidly enforced that there should be no exploitation of patented devices or special products on the floor of the convention.

When, however, the heat-treated axle was under discussion, and two representatives of steel companies making such an axle had spoken and promised assistance, and had repeatedly referred to "our" practice and "our" product, a third arose and flatly asserted that his company had been unfairly treated in that they had not been invited to join the conference, and they should have been invited to make their recommendations, because as it stood it was a condition of unfair discrimination. He was told with equal directness that he was incapable of making an axle that was suited to heavy traffic and would have to be content to take light-work orders. Such controversies are undignified and a repetition would be apt to result in a war of words if the disputants failed to keep their tempers and attempted to fight it to a finish. Under the conditions of associate membership it is difficult to see how such a possibility can be well avoided.

Harking back once more to this matter of standardization, its scope can be appreciated when it was urged that certain standards of construction should be adopted for passenger work, as though local conditions could be disregarded. And yet the impression conveyed in the discussion was that it was the idea of the man and not his surroundings that was responsible for the present discrepancies of practice, although each individual must have known that he had very good reasons for what he did and that it would cause no end of trouble to change. Probably each hoped that the other fellow would come to his practice.

In the papers devoted to track and maintenance of way there were a set of specifications for open hearth rails and a series of prints showing the forms for the proposed standardization of girder rails, which practically means the standardization of rails for urban work, a proceeding which, if carefully worked out, cannot fail to be of the same value to the street railways that the standardization of the T-rail has been to the steam roads. The care demanded is probably greater than with the T-rail because of the conditions of service. The provision of a suitable amount of wear in the head; the depth and width of the groove; and the adjustment of these dimensions to meet the demands of both tangent and curve work where widening of the gage is practised, must be looked to. As to the requirements on all of these points our information is woefully deficient, and it would seem that long and careful study would be required before a decision that is final can be reached.

Then, too, this rail question is complicated by the tendency of the head to corrugate, a phenomenon evident on most electric roads. No demonstrated reason has yet been developed, though many of the undemonstrated variety have been promulgated. The condition was well expressed in the Atlantic City paper, where it was asserted that the users were placing the responsibility for corrugations on the rail makers, while the latter promptly retorted by loading the conditions of traffic with the trouble. When it will be settled no one knows. The work of the convention, taken as a whole, was admirably well done, and the ample allowance of time for the presentation of the papers

and discussion of them produced results that cannot fail to be satisfactory. And this satisfaction is increased when the full attendance at all of the sessions is considered.

HARMONIOUS RAILWAY ACTION REGARDING SAFETY APPLIANCES.

THE policy adopted by the railways in handling with the Interstate Commerce Commission the question of what, and how, safety appliances should be put on equipment in obedience to the new safety appliances law, set a precedent the roads may follow with profit in handling similar matters in future. There were several conferences between a committee of railway mechanical men and representatives of the commission before the proposed standards were made public. Later, a general committee was formed to prepare data, select witnesses and present arguments at the hearings before the commission. This general committee appointed sub-committees to deal with the various phases of the subject, which included the preparation of statistics. It was suggested that all railways authorize this general committee on safety appliances to represent them in the proceedings before the commission. Two hundred and seven railways, operating 207,362 miles of track and having 2,103,138 freight cars, gave authorizations. Armed with these credentials, the general committee was able to appear before the commission as the spokesman of nearly all of the important railways of the United States. Before the hearings took place all differences of opinion between members of the committee as to what the policy of the roads should be were discussed and harmonized, and witnesses and counsel were selected; and, while some of the individual lines put in testimony and statements of their own, the general committee practically handled the entire case for the railways.

The advantages of this course of action are plain. Usually in the past when a matter of importance has been pending before a commission, a state legislature or Congress, either all the roads concerned have appeared individually or some have appeared individually, and the case of only part has been presented by a general committee. Some roads have asked for some things; others have asked for other things; and some have favored what others opposed. The matters discussed usually have been of a technical nature. The consequence of the failure of the roads to act in harmony has been to confuse the minds of the lawmakers or the commission as to what the railways really wanted and did not want, and the reasons for their attitude. The points regarding which the railways agree are usually the important ones; the points as to which they disagree are apt to be relatively or absolutely unimportant. The effect of the raising of the unimportant issues often has been to cloud the important ones and to lead the lawmakers and commissions to concede to the railways points of trivial consequence while deciding against them on points of the greatest moment. Quite often the result has been that the railways have lost on every point. For example, their failure to present a united front and vigorously and harmoniously state their case when the Mann-Elkins bill was pending, resulted in the passage of a law which includes numerous provisions to which all the railways were strongly opposed and not a single one which any of them favored.

The Interstate Commerce Commission, particularly, has numerous heavy duties to perform. The amount of time and study it can give to any matter, however important, is but small. It would be able to give much more intelligent consideration to the various questions coming before it if the evidence of the railways was more commonly presented to it in a concentrated and consistent form. That the roads, when important matters are pending, such as the question of safety appliances, standards and general advances in freight rates, do not present a united front, is sometimes due to the fact that their officers differ as to the theory on which their cases should be handled; sometimes to the fact that they think their interests are different; and sometimes to both these things. But generally the respects in which their

interests are identical are so much more numerous and important than those in which they are antagonistic, and the advantages to be derived from presenting their case according to a consistent theory—even though it be not an ideal one—are so great that it would seem that the roads as a whole, and each of them individually, would usually gain more in the long run by acting together, as they have in regard to the matter of safety appliances, than one or a few can hope to gain by playing a lone hand.

NEW YORK, ONTARIO & WESTERN.

THE New York, Ontario & Western is a subsidiary of the New York, New Haven & Hartford; it is a pretty important one at present and is certain to be more important in the future. Pending that future development, the general policy of the controlling corporation is substantially to let the Ontario & Western take care of itself, under the single limitation of earning a fair return on the New Haven's investment. That investment is represented by \$29,162,200, at par, out of \$58,117,982 total capital stock, or a bare majority. The investment stands on the New Haven's books at \$13,108,397, showing an investment price of about 45 and an annual investment return of about 4.44 per cent.—a good investment by itself, but particularly so when future strategical advantages of the Ontario & Western are taken into account.

The main line of the Ontario & Western runs from Cornwall, on the Hudson river, northwest to Oswego, on Lake Ontario, 272 miles. It connects at Campbell Hall with the Central New England, which, via the Poughkeepsie bridge, connects it with the New Haven. It owns some 50 miles of branch lines and leases 174 miles.

Taking up the Ontario & Western as an independent railway proposition, the returns for the fiscal year 1910 are also satisfactory. Direct gross earnings rose from \$8,290,170 to \$8,578,782, accompanied naturally by the rise in direct operating expense, which was from \$5,643,101 to \$5,882,146, leaving the slight but definite rise of net operating revenue from \$2,647,068 to \$2,696,636, further decreased slightly by a deficit in outside operation, which increased from \$36,321 to \$43,842. The final showing is not quite so good, after charges. The inevitable increase of taxes from \$189,159 to \$211,693; a decrease of other income from \$428,410 to \$403,316, and increase of rentals, interest, etc., from \$1,506,870 to \$1,531,619, left net applicable to dividends \$1,312,797, as compared with \$1,343,127 in 1909. The dividend of 2 per cent. (\$1,162,328) left surplus over dividends of \$150,469.

The property was evidently well maintained. The figures of the year for maintenance per mile of road operated rose from \$1,867 in 1909 to \$2,099 in 1910, and, though maintenance per locomotive fell from \$2,859 to \$2,634, it rose per passenger and freight car from \$78 to \$85. More noteworthy is the increased cost of additions and betterments, which in 1910 were, for local betterments and additions alone, \$410,596, as compared with \$238,142 in 1909; and in the last fiscal year there was expended, besides, \$5,728 on main line second track, \$96,868 on the second track of the Scranton division, and \$195,382 on the extension of the Capouse branch to the Lehigh Valley lines. The total for all additions and betterments is \$933,757, as compared with \$802,124 in 1909. There have been purchased during the past summer 14 new locomotives, 500 coal cars and 7 passenger coaches. These various increases of the property necessarily imply new financing, which will be in the form of general mortgage bonds, to liquidate floating debt, and car trust certificates to the amount of \$700,000. But the new expenditures are evidently all of a type that yield quick returns. The form of the general balance sheet has been changed during the year so as to make itemized comparison unsatisfactory; but the slight upward change of the totals from \$93,810,123 to \$94,132,960 indicates no radical new financing. The profit surplus of \$5,706,795 in 1909 rises to \$5,893,138 in 1910.

Some of the items of increased business are worth notice.

Passenger earnings (local) rose from \$1,295,252 to \$1,365,982; through passenger business from \$211,334 to \$226,268. Local freight earnings—excluding, evidently, coal and brick—increased from \$1,012,456 to \$1,088,443, and through freight earnings, with the same exclusions, from \$851,152 to \$898,967. Coal earnings rose from \$3,875,583 to \$3,903,739, and the large brick business of the company from \$734,115 to \$766,153. But on the freight business there is one shadow very briefly referred to by Vice-President Childs in his sub-report in the words: "The differential freight rates which the company has used almost continuously since 1888 were withdrawn on March 15, 1910. Since that date the rates have been on what is called the 'standard' basis. The effect of such change has resulted in a large loss of traffic." The quoted words refer to the trunk line controversy of last spring and the threatened trunk line war of rates. It was, ostensibly at least, aimed at the Grand Trunk's differential via New London. President Mellen, of the New Haven, for the sake of peace, yielded the Ontario & Western differential, which was raised from 69 cents to the standard 75 cents on the through western business. The Grand Trunk, refusing to yield, has maintained its differential, and the Ontario & Western is the victim. But the reported new traffic arrangement with the Delaware & Hudson may be an offset.

The tables of the report extending through many years show the advance of railway efficiency. One notes, for example, the average increase in weight of engines to 70.44 tons in 1910, as compared with 54.7 tons 10 years ago, and 34.5 tons in 1881; in the average freight car capacity to 31.33 tons in 1910 from 27.71 tons ten years ago, and 13.68 tons twenty-five years ago; and the rise in the tractive power of engines from 13,870 lbs. in 1885 to 20,570 lbs. in 1900, and 26,080 lbs. ten years later. In the last three years the average tons per train have risen from 276 to 281, and average per car from 13.03 to 13.38. Operating ratio was 76.55 per cent. in 1890; now 68.56 per cent. In the use of foreign cars the company is a debtor line with an adverse net balance of \$120,151.

As a large and slowly but evenly developing subsidiary of the New Haven, with possibilities, not at all remote, of expanding considerably its coal business and becoming a more and more important member of the anthracite group, the Ontario & Western is not without interest. But its more remote future will be its development on a larger scale, now that it has become a frontier property of the New England railway monopoly. Not many months have gone by since it was an open secret that, by new arrangement with the New York Central for transferred business between the junction point, Oneida, N. Y., and the Niagara frontier, it was proposed that the Grand Trunk should gain entrance to New York City via Weehawken—this to be attended, perhaps, with Grand Trunk concessions to the New Haven in southern New England. One may also consider the Ontario & Western's northern outlet on Lake Ontario not so very far from extension to the Canadian railway systems; or, turning eastward, the New Haven's northern extension through Westchester county, to connect ere long with the Poughkeepsie Bridge route, and, by it, with the Ontario & Western, has something more than a hint of a new eastern entrance of the latter to New York City in addition to that firmly secured already by its trackage rights over the West Shore.

The annexed table shows the more important results of operation in 1909 and 1910:

	1910.	1909.
Mileage	846	835
Freight revenue	\$6,649,635	\$6,465,585
Passenger revenue	1,592,250	1,506,585
Total operating revenue	8,578,782	8,290,170
Maintenance of way	1,034,454	920,196
Maintenance of equipment	1,316,045	1,380,386
Traffic	130,243	114,263
Transportation	3,191,408	3,053,847
*Total operating expenses	6,125,742	5,899,401
Taxes	211,693	189,159
Operating income	2,696,636	2,647,068
Gross corporate income	2,844,417	2,421,587
Net corporate income	1,312,797	1,343,127

*Includes "outside operations."

SOUTHERN RAILWAY.

A YEAR ago the Southern Railway was just emerging from a crisis which had threatened its very corporate existence. In the twelve months ended June 30, 1910, the company has shown that its period of uncertainty is past and that it has definitely made progress on the uphill road. In 1910 the company earned \$57,300,000 gross, or \$8,127 per mile; and after the payment of operating expenses, which included ample maintenance, the company had net operating revenue of \$18,700,000, an increase of 13 per cent. over the net of 1909. As a matter of fact, the road that in 1907 seemed almost on the verge of disaster earned in 1910 over 9 per cent. on its preferred stock. It wisely paid nothing, choosing rather to use the surplus to help extinguish the discount on securities sold in 1909. President Finley, in an engagingly sincere man-to-man talk with his officers, says: "The future success of the company under existing economic conditions depends largely upon its relations with the public, who are its customers. * * *" By analogy, the company's success last year was due to its improved relations with the public and to the greater efficiency of its employees.

There is a tendency in discussing the Southern Railway to patronizingly say that this or that is good "for the Southern Railway." This is hardly just. In so far as the main lines are concerned, the Southern's standards of construction and of operation, as well as of maintenance, are on a parity with those of other great railway systems.

The Southern Railway lines may be fairly accurately divided into three classes. The line from Alexandria across the Potomac from Washington to Lynchburg, Va., is representative of the first class. A good part of this mileage is double tracked. The double-track road has been built in the last few years. It has a maximum grade of 0.6 per cent. and a maximum curvature of 4 deg. Bridges and culverts are all permanent steel and concrete structures. It is laid with 85-lb. rail and is rock ballasted. It replaces an old single-track line, in the sense that it runs between the same two termini. At Lynchburg there is a great deal of very expensive work now under way. The old line dipped down to the level of the James river and then wound up the hill on the other side of Lynchburg. The new double-track line which is being built maintains the grade north of Lynchburg, and will cross the James river by a viaduct now partly built, thus avoiding about 100 ft. of dip.

The line from Sycamore, Va., to Danville, and the line from Atlanta to Birmingham, are two types of the second class of line in the system. The line from Sycamore to Danville is part of the old main line of the Southern. It is single track, laid with 85-lb. rail, well ballasted and well maintained. It has numerous 1 per cent. grades and many curves, some of them 6 deg. It is obvious that this line and other stretches like it will have to be double-tracked and brought up to the standard of the line north and south of it. The other type of this second class, the line between Atlanta and Birmingham, has a great number of curves, and nearly the entire line is on grade, both eastbound and westbound. It is laid with 85-lb. rail, has a maximum grade of about 1.2 per cent., although most of the grades are 1 per cent. or less, and is ballasted either with rock or slag. The structures are nearly all wooden, and during the past summer a large number of new ties were placed in track and considerable stretches of new 85-lb. rail were laid. Notwithstanding that this is single-track line, it is estimated that it can handle more than twice the traffic that it now gets without increasing the present facilities. It would appear that to rebuild such a line as this at present would be foolish extravagance. Its operation is expensive, but it is there, and it can handle the business; and it is not necessary to have a knowledge of higher mathematics to see that to throw away a tool which is perfectly capable of doing its work and replace it with a new, more expensive tool which could not conceivably be used to full capacity and pay interest on both the cost of the old tool and the new, would be business folly.

The third class of lines comprises the branch lines, of which there are more than 3,500 miles in the Southern Railway. These branches reach out into the country, affording comparatively

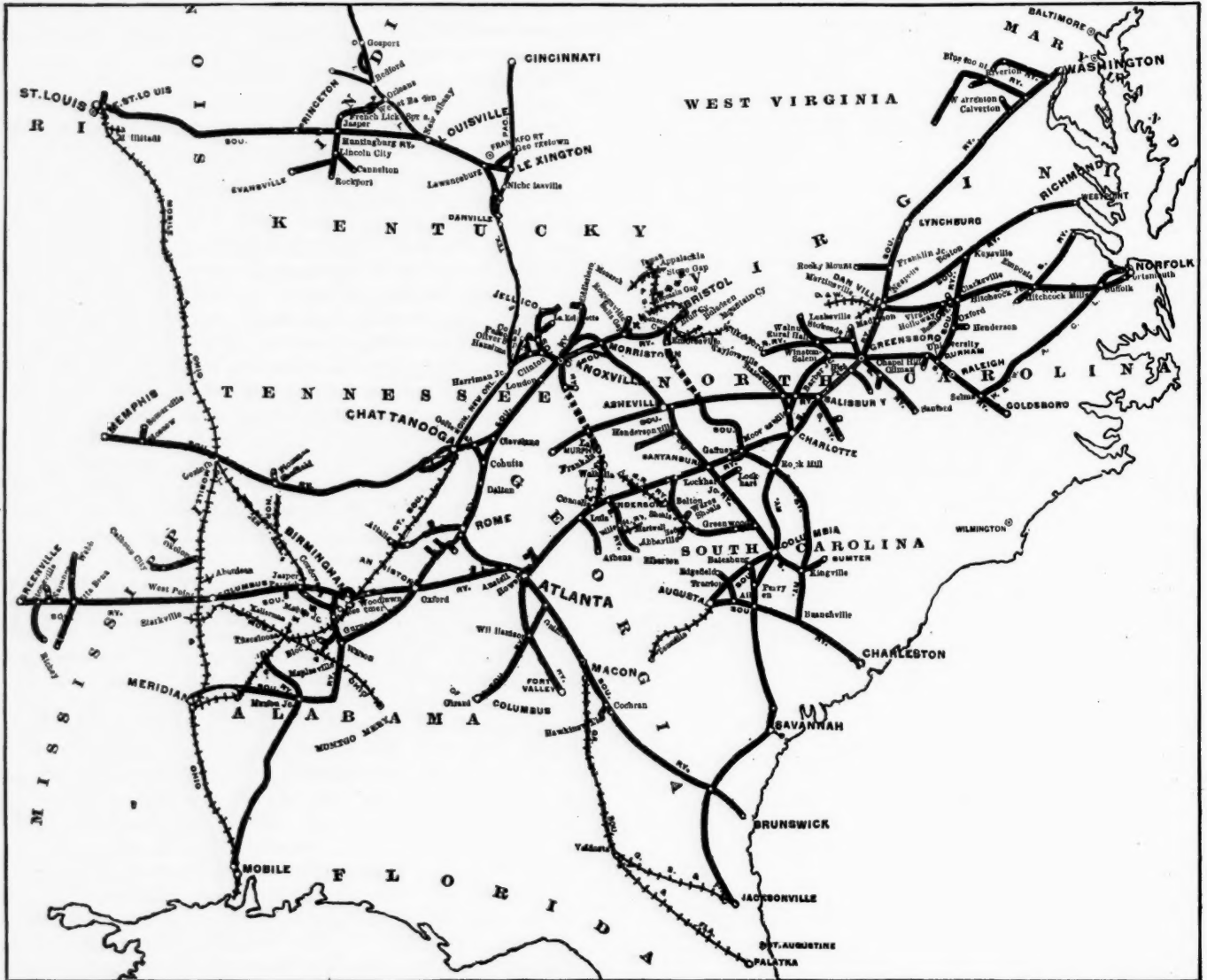
thinly populated agricultural districts railway facilities which, while pretty poor, are in reality the only hope of future development. These branches are laid with light rail and are lightly ballasted; in many cases their operation is as yet quite unprofitable.

As to passenger stations, in the majority of cases in the smaller towns the railway station is far and away the best building in the place. In the last few years a great number of new passenger stations have been built, probably many of them against the better judgment of the railway officers, because of the pressure of public opinion demanding these improvements; but the demand for attractive, clean stations, if accompanied by an appreciation of them, is in itself a good sign for the Southern.

The South has been more backward than any other section of

are more to be desired than an immediate gain in traffic.

In 1910 355 new industrial plants on the lines of the Southern Railway were completed. Of these, 69 were lumber mills, 36 textile mills and 21 cotton seed oil mills. The South is beginning to understand the economic advantages to be gained by manufacturing its own raw products. One aspect of the establishment of new cotton mills is rather interesting from the railway's point of view. This is the increased use of electricity, generated by water power, as a means of power in cotton mills. The cost of electricity is slightly greater in most cases than the cost of generating steam power by the use of coal. The power, however, furnished by the transmission lines is steadier and permits of greater output than is the case when steam engines



Southern Railway.

The Southern does not operate the lines shown crosshatched, but has an interest in them.

the country in its development—it is the haunt of the hook worm. But in the last few years there has been a marked change. Whitewash is used more freely; pride is taken on the condition of the front doorstep and more diversified farming is being undertaken. A Southern Railway officer will point with pride to a cornfield that was previously a cotton field; and here is a rather interesting contradiction that shows the extent to which the Southern Railway interests are allied with the welfare of the South. Cotton is one of the most profitable commodities which a railway can carry. The railway is sure to get traffic from the cotton raiser, while corn may be hauled by wagon to a mill and consumed locally. The triumph over one farmer's change from a grower of cotton exclusively to a grower of corn as well is an appreciation of the man's own growth and an acknowledgment that better citizens

are used. The use of electricity takes away from the railway the haul of coal that it would have got if the mill had used steam power; but this latter, it is estimated, is more than compensated for if the mill can better meet the competition of its Massachusetts rival.

Of the total tonnage carried in 1910, products of mines contributed 39.69 per cent.; products of manufactures, 30.16 per cent.; products of forests, 18.13 per cent.; products of agriculture, 10.86 per cent.; products of animals, 1.16 per cent.

In connection with the active efforts at colonization that are being carried on by the Southern's industrial department, it may be noted that the tonnage of agricultural implements amounted to 30,209 tons in 1910, as against 14,476 tons in 1909; and the tonnage of household goods amounted to 43,654 tons in 1910, as against 22,628 tons in 1909. Under manufactures and miscella-

neous, only cotton factory products and petroleum and its products show any decrease from the tonnage of 1909.

The gain in gross business in 1910 on the Southern, which amounted to over \$5,000,000, was to have been expected, but the gain in net, which amounted to \$2,000,000, is highly encouraging. Moreover, a study of the details of operating expenses shows that the gain in net is much more noteworthy than the percentage of increase would indicate. To repeat, operating expenses as a whole amounted to \$38,600,000 in 1910 and to \$35,600,000 in 1909. Maintenance of way and structures cost \$6,600,000 in 1910 and \$6,000,000 in 1909; maintenance of equipment cost \$9,900,000 in 1910 and \$8,200,000 in 1909; while transportation expenses cost \$18,900,000 in 1910 and \$18,300,000 in 1909. In other words, of the total increase of \$3,100,000 in operating expenses, 21 per cent. was in maintenance of way, 50 per cent. in maintenance of equipment, and only 23 per cent. in transportation expenses. Transportation expenses consumed 33 per cent. of gross operating revenues in 1910, as against 35 per cent. in 1909. It was to be expected that maintenance charges would be higher in 1910 than in 1909. The company had economized in 1909, as compared with 1908, and so considerable overhauling was postponed until 1910. The table shows the unit costs of maintenance:

	1910.	1909.
*Maintenance of way, per mile.....	\$832	\$745
†Repairs, per locomotive.....	2,220	1,445
“ “ passenger car.....	609	554
“ “ freight car.....	64	50

*Per mile of first, second, third, etc., track, the cost of two miles of siding and switch tracks being taken as equal to the cost of maintenance of one mile of main track.

†This is for repairs only and does not include renewals, depreciation or superintendence charges.

The figures for 1910 not only show extraordinary increases over 1909, but are large in themselves. For a road having as much branch line and side track mileage as the Southern Railway, \$832 per mile of track is a large sum. Anything over \$2,000 for repairs only of locomotives is large.

Under transportation expenses it is interesting to note that less was spent on the following seven accounts in 1910, notwithstanding the greater train movement and traffic carried, than in 1909: Despatching trains; yard, switch and signal tenders; lubricants for yard and road locomotives; telegraph and telephone operation; loss and damage to freight; and damage to baggage.

The trouble that threatened the Southern in 1907 was due to an almost complete collapse of credit. The plan to raise new funds and to refund maturing securities was perfected in 1909 and was commented on in these columns in the discussion of the 1909 report. The results of that highly skillful financial plan put through in 1909 are shown in the balance sheet and capital account, as well as in the income account, in the 1910 report. On November 1, 1909, the three-year convertible 6 per cent. notes due 1911, amounting to \$11,105,000, were redeemed. On February 1, 1910, \$15,000,000 three-year 5 per cent. notes, which were issued in 1907, matured and were redeemed. Of this debt, \$5,000,000 was paid off in cash with treasury funds, and the balance was renewed by the issue of \$10,000,000 5 per cent. notes due February 1, 1912. On January 1, 1910, the three issues of Atlanta & Charlotte Air Line bonds, amounting in the aggregate to \$5,500,000, were refunded by their acquisition under provisions of the first consolidated mortgage; \$5,000,000 of consolidated bonds being sold. Through these and other refunding operations, the amount paid for interest on funded debt and equipment obligations was less in 1910 than in the previous year, despite the fact that a full year's interest on the \$41,333,000 development and general mortgage bonds issued during 1909 was paid only in 1910. The \$5,700,000 surplus after the payment of fixed charges was credited to profit and loss, and there was charged off to profit and loss \$2,800,000 discount on securities sold in 1909. There is now but \$4,850,000 discount left undisposed of on the balance sheet. The wisdom of using current surplus to extinguish bond sales discount instead of using any part of it to pay dividends cannot be too strongly emphasized.

The balance sheet shows that the company had current assets amounting to \$22,200,000 in 1910, of which \$8,700,000 was cash

in the treasury. In 1909 the total current assets amounted to \$18,400,000, of which \$11,100,000 was cash in the treasury. There was an increase of about \$6,000,000 in miscellaneous current securities held in the treasury. Current liabilities in 1910 totaled \$13,600,000, of which \$1,700,000 was bills payable, including current obligations for new rail; in 1909 current liabilities amounted to \$11,500,000, of which \$1,000,000 was bills payable.

A word should be said in regard to the form of the annual report. The report furnishes as complete a fund of information as even the nice theories of accounting developed by the Interstate Commerce Commission under Professor Adams has been able to ask. A detail illustrates this. In the statement of materials and supplies on hand each separate class of supply is stated and the value at which it is carried is given.

The following table shows the results of operation in 1910, compared with 1909:

	1910.	1909.
Average mileage operated.....	7,050	7,030
Freight revenue.....	\$38,161,392	\$34,376,619
Passenger revenue.....	14,639,161	13,510,791
Total operating revenue.....	57,294,508	52,188,107
Maint. of way and structures....	6,635,725	6,016,661
Maint. of equipment.....	9,876,729	8,193,753
Traffic.....	1,436,776	1,252,328
Transportation.....	18,934,427	18,348,507
Total operating expenses.....	38,635,746	35,568,981
Taxes.....	1,979,722	1,916,702
Operating income.....	16,698,020	14,939,388
Gross corporate income.....	19,877,156	17,737,699
*Net corporate income.....	5,757,019	3,589,385
Additions and betterments.....	52,373	78,285
Surplus.....	5,704,646	3,511,100

*The deductions from gross corporate income include \$266,806 in 1910, and \$535,214 in 1909, discount on securities sold, proportion charged to income. These sums are in addition to the amounts charged off through profit and loss.

NEW BOOKS.

Railroad Administration. By Ray Morris. Published by D. Appleton & Co., New York and London. 309 pages; 6 in. x 8 in.; cloth. \$2.00.

The first chapter, "The Beginnings of a Railroad," is one which every intelligent person should read and will enjoy reading. It is a plain statement of what the American banker, or other agent for investors, needs to be shown in order to induce him to advance money to build a new line of railway. Aside from the dangers of destructive competition, and the necessity for an independent line to have more than one rail connection with the rest of the world, the volume of expected traffic and its probable growth must be computed and checked by several methods. These are described well and completely, although briefly. It is difficult to imagine that any reasonable person, after reading this chapter, could remain, or become, a believer in the valuation of railways for the purpose of rate making; and it suggests that this part, as well as the entire volume, is well adapted for a university text-book.

The study of organization and management begins with a very small road, the Hearne & Brazos, only 18 miles long and with one locomotive. The president is in New York, exercising "static functions" only, but the general manager is at Hearne in charge of the "dynamics." Then the Salt Lake & Ogden, 50 miles, with 10 locomotives, with the president acting as general manager and having both static and dynamic duties. The author's careful examination of the kind of officers needed on the smaller roads shows clearly, in miniature, the basis of organization for any road, provided that organization is a divisional one.

The volume is well illustrated with organization charts of American railways: the Norfolk & Western, the Union and Southern Pacific systems, the Pennsylvania, the New York Central, the Buffalo, Rochester & Pittsburgh, and the Rock Island. In the discussion of these varying methods Morris has availed himself of his exceptional opportunities to familiarize himself with their practical workings, and he speaks frankly and unsparingly. American practice tends strongly to divisional, rather than departmental, organization, and this change seems to be due to the inevitableness of emergencies requiring greater flexibility and fuller authority for the one man who is on the spot—

the division superintendent—so that he can command, and be accustomed to command, the technical as well as the operating forces.

"A railroad managed on the departmental plan is not comparable to an army. The company, or division, here has several partial commanders, reporting to headquarters through different channels; the lines of authority do not concentrate short of the general superintendent or of the general manager. Such a situation would be created in an army if one lieutenant in each company was in charge, let us say, of small arms practice, reporting neither to the captain nor the colonel, but to an adjutant on the brigadier-general's staff, while the other lieutenant was a lieutenant of engineers, reporting likewise to the brigadier-general's staff. With a mobile unit, like a military company, such an organization is unthinkable; with a fixed unit, like a railroad division, it can be managed, though the results are questionable."

The chapter on the scope and limitations of the work of railway staff and line officers is an instructive and fine example of condensed statement of present-day requirements for an efficient president, general manager, general superintendent, division superintendent, superintendent of car service, trainmaster, superintendent of motive power, master mechanic, chief engineer, division engineer, comptroller, treasurer, auditor and traffic department officers.

The fundamental differences in foreign and American methods of administration are shown in the organization charts of the London & North Western, the London & South Western, the Lancashire & Yorkshire, the Prussian State Railways, the East Indian Railways, the Paris-Orleans, and the Paris, Lyons & Mediterranean. A clear statement is given of the reasons for difference, and for this Morris was reasonably well equipped by a pretty thorough practical acquaintance with British railway operation.

In a series of charts, of novel design, he compares the control of minor employees (from conductor to laborer) in England and America, and traces that control back through the departments to the head of the company.

In an appendix is given a description of the Unit System of railway organization, designed by Major Hines, already applied to many divisions of the Union Pacific, and to be applied to the entire Union and Southern Pacific systems.

Heat Engines. By Professor John R. Allen and Assistant Professor Joseph A. Bursley, University of Michigan. McGraw-Hill Book Company, New York and London. 280 pages.

So much that is acceptable on this general subject is already available that a new book to justify itself must either be very well written or it must present some new grouping of topics. The work of Professors Allen and Bursley merits attention upon both of these questions. It is well written, and though it contains but 280 pages it deals with the whole field; with the thermodynamic theory and with the mechanism of various forms of steam and gas engines. There are four chapters dealing with heat, thermodynamics, properties of steam and calorimetry; three chapters discuss fuel, boilers and boiler auxiliaries; two brief chapters describe the elementary theory of the steam engine and the different types of such engines; six other chapters discuss the testing of steam engines, valve gears, governors, compound engines, condensers, air pumps and steam turbines; three chapters are devoted to the problems of the gas engine; and a final chapter presents a brief general discussion of the economy of heat engines. This summary by chapters will serve to make the purpose of the book clear. It is an elementary text, not a treatise. It cannot be exhaustive in its treatment of any one of its several widely different topics, but it can, and, in fact, does, constitute a simple and readable course of study touching all of the more important phases of the heat engine problem. Judged by this standard, the book is in every way excellent. All but the simpler equations developed by the text are illustrated by numerical solutions which make easy reading for the beginner. Each chapter ends with a series of problems in good variety and admirably stated, by which the student may test his skill in applying the principles of the text. The book will be found serviceable to those who seek to secure, by as direct a path as possible, a general view of the construction and action of the more common types of heat engines.

RAILWAY CAPITAL AND CAPITALIZATION.

BY WILLIAM Z. RIPLEY.

Professor of Economics, Harvard University.

The definition of railway capital is a far simpler task than its actual determination; and yet even that is not altogether easy. It consists of tangible assets, such as real estate, rails, locomotives and cars, and, in addition, all the attributes of a going concern usually known as good-will, including among other things profitable contracts and alliances and reputation. These more or less real assets are commercially represented by securities. And it is the aggregate of this paper certification of value, taken at par, which constitutes a railway's capitalization. These securities being the agencies by means of which money was raised to construct and operate the railway, are also commonly known as capital, the term being thus used in a commercial rather than an economic sense. Thus these two terms, capital and capitalization, are often used interchangeably, on the tacit assumption, first, that the real value of the property, judged by its earning power, is equal to the amount of its certificated worth on paper; and, secondly, that therefore in some way the asserted value is a realizable one in terms of cash. Usually in the case of going concerns, in normal times, these assumptions are more or less true, the degree of approximation to truth being measured by the deviation of the market price of the securities above or below par. Only in those instances where the assumption is absolutely true, that is to say, when the securities are commercially worth their face value, can it be said that the capitalization and the capital are equal. In all other cases the amount of the actual investment is more nearly represented by the aggregate market price of the securities, while the capitalization is a purely artificial total arrived at by taking the amount of these securities at par instead of at the market price. Although purely artificial, it is difficult to disabuse the public of the impression that it represents a very real thing. It may or it may not, according to circumstances.

The primary division of railway securities is into the two groups, respectively, of capital stock and evidences of indebtedness. The distinction between these two is fundamental. The shareholders, represented by the capital stock, are the owners of the property, charged with the responsibility of its administration, for good or ill. The holders of its evidences of indebtedness, on the other hand, be these bonds or promissory notes, are merely creditors of the enterprise. At first sight it would thus appear as if only the stock of a railway constituted its capital, while its bonds or promissory notes were of the nature of charges thereon. But in practice this is not so. For, although bonds in form represent a mortgage, yet their issue and sale was probably one means of collecting the funds necessary to create the property against which the mortgage lies. In the two most recently built transcontinental railways, for example, the Chicago, Milwaukee & St. Paul extension and the Western Pacific, practically all the funds were raised by the issue of bonds, taken by the parent or allied lines.* The capital stock, also held by these companies, has little or no commercial value, except for purposes of control. This stock was given as a bonus with the bonds. These facts are well recognized in English financial parlance, which designates the two groups as share and loan capital, respectively, as a result of these circumstances. The stock of few corporations stands for the entire investment. It seldom measures the full value of the property. For the full value of that property one must take account of both share capital, or capital stock and bonded debt.

Not all of the indebtedness, however, can be held to have been incidental to the creation of the property. Some of it may have been incurred in connection with its current operation. This distinction usually appears in the differentiation of funded indebtedness from current liabilities. Funded indebtedness represents long-time investment by creditors, while the other forms are merely incidental to its recent conduct. No separation in

*It might be pointed out that most of the actual money spent on the St. Paul's extension was obtained from the public by the issue of stock of the St. Paul. [EDITOR.]

this regard appears in the official Statistics of Railways of the United States prior to 1896, which up to that time indiscriminately included all current liabilities, such as bills payable, audited vouchers, and wages and salaries due, on the ground that, although being circulation as distinct from fixed capital, they nevertheless represented actual investment in the enterprise. But since 1896, at the instance of the American Association of Railway Accounting Officers, these latter forms of indebtedness have been separately classified. How considerable an item these current liabilities may be appears from the fact that in 1906 they amounted to no less than \$5,133 per mile of line for the whole United States. Still another modification of the official data appears in the Statistics of Railways for 1908, in the re-inclusion of short-term railway notes in capital. In 1896 they had been deducted from it as being one form of current obligations. These notes, as will appear later, have been much resorted to since 1905. They originally stood for unsecured indebtedness, but in these later years, being incurred in order to raise funds for improvements, are properly treated as railway capital. The revised official statement in 1908 permits the separation of mortgage and collateral trust bonds, of plain bonds, debentures and notes, of income bonds, equipment trust obligations and miscellaneous obligations. All of these are included in capital under the head of funded debt.

There still remains the most important consideration of all in the determination of railway capital. A clear distinction between gross and net capitalization is always necessary. The absence of this practically vitiates all of the federal as well as other private data concerning railway capital between 1899 and 1907. Prior to this time the practice of interinvestment of railways was not common. Methods of financing were simple and direct. Most railways were merely operating common carriers. The overwhelming majority of stock and bond issues were based upon the real property or earning power of the issuing company by itself. Therefore the figures given by Poor's Manual of Railroads and the United States Statistics of Railways were approximately correct. The principal exceptions were the Pennsylvania and Southern Pacific companies, and some of the anthracite coal roads, notably the Philadelphia & Reading and the Erie. These latter companies had extensive reserves of coal lands, purchased through the sale of bonds. Obviously such bonds were not a part of their railway capital as such, and inordinately swelled the volume of capital apparently devoted to transportation. But soon after the resumption of prosperity in 1898, largely as a result of consolidation into large systems, railway companies began on a large scale to acquire securities of other roads either for investment or control, and oftentimes to raise funds therefor by the issue of their own stocks or bonds. Such collateral trust bonds or securities, based upon the deposit of other stocks or bonds, were, of course, merely duplications of existing issues, unless used as a means of inflation otherwise. Hence the amount of "securities owned" should have been deducted from the gross capitalization in order to obtain the net amount of capital to be supported by operating income. From 1898 to 1907 such duplication of securities issued, progressively falsified the returns as to capital obtained by totalizing all issues of stocks and bonds by railway companies. Nor did the distinction between "capital in the hands of the public" and "owned by other railways" in the federal statistics enable the net capital to be accurately ascertained. The railways of the United States thus held not less than \$12,100 out of a total of \$65,926 per mile of line in 1905. This apparently left a balance of about \$54,000 capital outstanding per mile of line "in the hands of the public." This form of statement roughly sufficed for the returns made by each system as to its own finances. But obviously it was often impossible for any company to ascertain what portion of its securities, openly issued to the public, had ultimately found a lodgment in the treasury of other companies outside its own system. Hence even this data was open to grave objection.

The imperative need of correct returns as to the amount of railway capital to be supported by current earnings led to a comprehensive and detailed investigation of the whole subject.

A special report in 1908 of the Interstate Commerce Commission on Intercorporate Relations of Railways was the result. And not only was a careful analysis made for the year 1906, but the system of annual returns was so remodeled that the actual net capital outstanding year by year could be made known thereafter. These official figures, then, show, first, the total of outstanding securities based upon railway property, as distinct from such capital based upon other securities; and secondly, they show this total after elimination of all such securities held by the railways themselves. For 1906 the grand total of outstanding securities for the railways of the United States amounted to \$9,342,900,000 of funded debt and \$8,884,200,000 of capital stock. From this gross capitalization there should be deducted \$1,440,300,000 of funded debt and \$4,114,800,000 of stock held by railway corporations, thus leaving in the hands of the public \$7,902,600,000 of debt and \$4,769,300,000 of capital stock. Making allowance for railways under construction, there remained an average of \$36,173 of funded debt and \$21,877 of capital stock per mile of line in the hands of the public. This total net capitalization per mile of line of \$58,050 for the railways of the United States may be taken as a bench mark for subsequent calculations. It amounts to a substantial reduction—\$10,000 per mile of line—from the figures in current use prior to that time. For the year 1907 this net railway capital was \$58,298 per mile of line. This figure, it will be observed, comprehends, in addition to all strictly railway securities, an aggregate also of \$460,302,000, consisting of miscellaneous investments of railways in other enterprises, from mining and lumber companies, electric street railways and steamship lines, to opera houses and newspapers.

A bald comparison of official figures shows an apparent increase in railway capitalization from about \$60,000 in 1890 to \$70,000 in 1907 per mile of line. These figures are, however, entirely misleading, for reasons heretofore given, principal among which is the duplication of issues incident to the growing complexity of intercorporate relations. No way of accurately measuring this change is possible, owing to the imperfectness of the returns in earlier years. There can be little doubt, however, that the net capitalization of American railways per mile of line has substantially increased during the last twenty years. In other words, issues of securities have grown much faster than mileage. This increased capitalization, aside from intercorporate financing, is accounted for, naturally enough, in various ways. It should not, by itself, be interpreted as indicating a tendency toward undue financial expansion, popularly characterized as stock watering. Enormous investments by roads already existing in 1890 have been rendered necessary by the steady filling up of the country and the growing density of traffic. Between 1890 and 1907 the density of traffic has increased for passenger service by nearly two-thirds, and for freight service it has more than doubled. On the great trunk lines the density has vastly exceeded even these notable figures. To accommodate this business many roads have been double and some have been quadruple tracked. In the period above mentioned, while only 66,000 miles of new line have been built, trackage has increased by 128,000 miles, or nearly twice as fast. The demands of the public for better, and particularly for speedy and specialized, service constantly requires more capital per mile of line. And the mere filling up of the country and the growth of large cities puts a heavy strain upon the roads for all sorts of improvements. It would be of great value and interest to compare the growth of these demands with changes in the volume of capitalization per mile. But the unfortunate circumstance must be recognized that data for any such analysis simply does not exist. In this field such matters must be matters of guesswork.

Determination of the net capitalization of individual railways along the lines indicated above is a difficult matter, owing primarily to the growing complexity of intercorporate relations. Unfortunately the above-mentioned Report on Intercorporate Relations of Railways did not attempt an investigation in this regard, its interest being solely the determination of the net capitalization, not of individual companies, but of the railways of

the country as a whole. Hence, our process of determination is rendered not only perplexing but imperfect by reason of the limitations of the official statistical data. In the first place, all duplication must be avoided, by subtracting from the total of outstanding securities of all companies within a given system the amount of such issues which are held within the group. In 1901 the Reading Company acquired \$14,500,000 par value of the capital stock of the Central Railroad of New Jersey, paying \$160 per share for this majority holding. The Reading Company then raised the necessary funds by issuing its new collateral trust bonds, based upon the deposit of this stock. Obviously the value of this investment should be deducted from the total capitalization of the system, which includes the Jersey Central lines, as otherwise the purchased stock and the Reading bonds based upon it, added together, would create a fictitious total.

At this point a few more concrete instances of the magnitude of inter-railway investments may not be out of place. The gross capitalization of the Pennsylvania Railroad in 1906 was about \$110,000 per mile, but of this sum about \$60,000 stood for security holdings, leaving a net capitalization of only about \$50,000 for a system of largely two and often four tracks. In a similar way the apparently heavy capitalization of \$95,000 per mile of the New York Central shrinks to less than \$60,000 when allowance is made for investments equal to nearly \$40,000 per mile. The most conspicuous example of this kind is, of course, the Union Pacific Company. Practically one-quarter of its net income in 1906 was derived from investments, enough, in fact, to permit payment of its fixed charges and the customary 4 per cent. dividend on the preferred stock without moving a ton of freight or carrying a passenger.* Without approving in the least of the dangerous financing by which this result was obtained, one must nevertheless concede that its gross capitalization of \$133,000 per mile of line in 1905 needs substantial correction before comparisons may be made with other roads not engaged in a general banking and brokerage business. In four years prior to 1907, according to the testimony of President Mellen before a Massachusetts legislative committee, not less than \$157,000,000 in capital had been raised by sale of securities, of which \$103,000,000 had been expended for investments in other companies and \$10,000,000 for real estate for terminal purposes. Distribute this sum over the line mileage of the company and a deduction of a large amount from its gross capitalization would be the result.

The fair market value of investments, by one road in other companies, rather than merely the par value, ought properly to be the basis of all calculations. In the case of the Reading Company, it paid \$160 per share for its holdings. This would make the actual cost of \$14,500,000 par value equal to \$23,200,000. The present market price of this stock is now nearer \$300 per share. On the other hand, the Illinois Central holds all of the capital stock and all but \$96,000 of the \$49,111,000 bonds of the Yazoo & Mississippi Valley. Whatever they may have cost the parent company, the fact that this subsidiary road has for two years failed to earn its fixed charges by a round half million dollars certainly would cause calculations based upon par value for its investments to deviate widely from recognized fact. Unfortunately, however, it is practically impossible to take account of such market prices in any general investigation. Aside from the mere labor involved, it is often impossible to ascertain the market value of inactive securities, some of which may have reposed in safe deposit boxes for many years; some perhaps, such as the capital stocks of the new transcontinental lines, having never had a public quotation. One must be content to inventory such holdings within a system at par. This may do injustice at times; but, on the whole, it seems probable that plus and minus errors will largely balance.

Eastern roads will be generally prejudiced by basing conclusions upon par values; while roads in the West and South will be benefited by it. Par values, at all events, are the best one can find, and must suffice for general purposes.

(To be continued.)

*Quarterly Journal of Economics, XXI, 1907, p. 672.

RAILWAY SIGNAL ASSOCIATION.

The fifteenth annual meeting of the Railway Signal Association was held at the Hotel Jefferson, Richmond, Va., on October 11, 12 and 13. There were about 400 members and guests in attendance. President H. S. Balliet (Grand Central Terminal, New York City), presided. Secretary C. C. Rosenberg was detained at home by reason of a death in his family.

The association was welcomed to the city of Richmond by the Mayor, the Hon. D. C. Richardson, who, in addition to the usual pleasant phrases of such speeches, gave a leaf out of his own experience in the signaling field. As a lawyer he had several years ago been counsel for the inventor of an automatic stop and cab signal which was tried on the Baltimore & Ohio, and which did what was claimed for it; but the usual practical difficulties ensued and the story ended in a tragedy. Following the disappointments resulting from the experiments, which were conducted near Baltimore, the inventor, who was a resident of Richmond, committed suicide.

Following the Mayor, Mr. Balliet gave the president's annual address. Looking back over his 28 years of railway experience, he gave a brief sketch of the marvelous progress that has been made in that time; and this is apparent not alone in machinery and methods but in the character of the men. He referred to the increase in recent years in the mileage of railways block-signaled, and said that for the year 1910 there would be important additions on many roads, which will probably aggregate 933 miles of road equipped with manual block signals, 1,419 miles with controlled manual, and 8,900* miles with automatic block signals and electric train staff. Also, about 360 interlocking plants will be built this year. He referred to the enormous traffic on the busiest lines, such, for example, as the Interborough subway in New York City, with 1,900 trains a day, and the holiday traffic of the large terminal stations. One terminal referred to (presumably the Grand Central in New York), on days preceding holidays, has trains in and out in 24 hours equivalent to a single train 61 miles long.

The president referred to the success of the intermediate meetings and said that judging by the experience of the past year it will be necessary soon to extend these meetings over two days, at least in the case of the New York meeting. He complimented the committees on having made particularly successful reports and on reaching definite conclusions, simplifying the work of the convention. The standards established by the association find ready recognition and are adopted widely. The association has decided, and rightly, that in specifications no mention should be made of proprietary names, but in discussions in the meetings it is quite likely that this rule might be relaxed with profit. Other associations have relaxed it. Mr. Balliet exhorted all the committee chairmen to carry on their work with a view to the early collection of material for a manual of recommended practice; such a publication ought to be made next year. As particular subjects for consideration during the coming year, he mentioned the standardizing of signal plans and the formulation of a standard contract between contractor and purchaser. The association should also consider the electrical requirements to be incorporated in agreements in reference to insulating and bonding around crossings where steam roads cross electric roads.

The report of the secretary-treasurer for the year ending Oct. 1, showed a membership one year ago of 1,139; new members and reinstatements, 196; total, 1,335. Loss by deaths, 8; by lapses and withdrawals, 134; total, 142. Membership Oct. 1, 1910, 1,193.

Cash on hand a year ago amounted to \$2,269; dues received (including some for the previous year, and including \$764 from representative members—part of this for 1909), \$3,873; advertising, \$1,692; total, including miscellaneous, \$8,184.

*If Mr. Balliet is correct in his estimate, this means an increase of automatic signals of more than four times as great as occurred in 1909. His estimate of new manual signaling seems to have been taken from the statement issued last spring by the Interstate Commerce Commission, as does that of controlled manual (which refers to single track lines of the Burlington).

Expenditures—printing, \$2,184; salaries, \$1,740; total, including other items, \$5,779. Cash on hand Oct. 1, 1910, \$2,406. A statement of assets and liabilities shows a surplus at the present time of \$2,502.

The report of the executive committee, which was adopted, recommended that from June 1, 1910, the salary of the secretary be \$125 per month.

PROPOSED AMENDMENTS TO CONSTITUTION.

The first subject discussed by the convention was the proposed amendments to the constitution. The proposal to move farther west the line which divides the association geographically was based on the feeling that the western members had not received their fair share of the benefits of the association. Mr. Anthony, who had recently analyzed the list of members, found that at present the number of active members in the eastern district (east of Buffalo and Pittsburgh) is 240, and in the western district, 274. If the line were shifted to Chicago and the Mississippi river the number would stand 308 in the eastern district and 213 in the western. Of junior members, the present numbers are 221 east and 132 west; under the proposed change 239 east and 114 west. But the only effect which the geographical line has on the activities of the association is in the choice of the vice-presidents, and the most prominent sentiment in the discussion was that the dividing line should be abolished. The only important geographical question in connection with the work of the association is to have the committees properly made up from men of the North, South, East and West. It was stated that there had been possibly some jealousy west of Chicago over the fact that the roads east of that city had too many of the officers, but the statement that this situation resulted from nothing but legitimate efforts to select men for their individual capacity, and in the utmost fairness, was not challenged. The discussion brought out a general expression of opinion as to geographical considerations, and Mr. Mann (Mo. Pac.) called attention to the fact that many members can attend committee meetings which are held within a single night's journey from their homes when they could not attend if the work necessitated an absence of two or three days from their offices.

The other proposed changes were briefly discussed. That concerning the nominating committee provides for the election of the members of this committee a year in advance; at present they are appointed. It is proposed to put three past presidents on this committee, to get the advantage of their acquaintance with the association, but they would not constitute a majority of the committee. The changes in the dates in the clauses relating to the annual meeting were proposed for the purpose of adjusting these parts of the constitution to the date of the annual meeting, in case it should be held in some month other than October.

All these proposed changes will go to letter ballot with a

full report of this discussion, as a guide to members in voting.

MECHANICAL INTERLOCKING.

The first committee report was that of committee No. 2, C. J. Kelloway, chairman. The recommendation of this committee concerning home signal connections was modified to read that pipe connected home signals at mechanical interlocking plants, where the automatic return to normal is not required, is "good practice," etc. The next recommendation of the committee, on motion of Mr. Peabody (C. & N. W.), by a vote of 14 to 5, was revised to read: "The committee recommends as good practice power-operated signals in mechanical interlocking plants at points where three-position signals are required to return to the stop position automatically and at all points where three-position automatic block signals are in use or are contemplated."

The conclusion of the committee concerning means of insuring the return of a signal to the normal position was approved. The specifications for concrete reported by this committee were referred to the executive committee to be harmonized with similar work done by other committees.

That part of this committee's report which dealt with arithmetical values to be given to the different units of an interlocking plant was referred back to the committee, and the paragraphs concerning specifications for wrought iron pipe, and correspondence with the committee on standards, were received as information. The additions to the specifications for interlocking proposed by the committee was accepted and ordered sent to letter ballot, as were those other conclusions, referred to above, which have to do with standards of practice.

In connection with the subject of mechanical interlocking, Mr. Rudd (Penn.) said that the committee on track of the M. W. association was engaged in designing patterns of fixtures which have to be fastened to rails which will be entirely clear of the ballast, and the committee had called his attention to the fact that bolts used for fastening bell cranks and other signal fixtures to ties, and which extend beyond the bottom of the tie, are objectionable because they may make an undesirable earth connection where track circuits are used.

POWER INTERLOCKING.

The report of committee No. 3 on power interlocking, B. H. Mann, chairman, was next presented. The report of this committee on the subject of methods of "indicating" and on the question of finding a substitute for the mechanical bolt lock was accepted as information. The same action was taken with reference to nine diagrams of typical indication circuits and circuits for operating electric motor semaphores. The committee accepted the suggestion that electric circuits which take the place of detector bars should be called "track indication circuits." The drawing of a circuit of this kind for use for power interlocking was criticized in relation to the arrangement of the



Charles E. Denney.

track battery on the side track, and the drawing was referred back to the committee. The matter relating to route-locking was offered by the committee simply as a report of progress and it was so accepted. With this, seven typical circuits were presented. On the subject of protection of wires in underground trunking the committee reported a code of specifications for treatment with pitch. This was discussed at considerable length, Mr. Cobb, representing a manufacturer, answering a number of questions. The makers can furnish pitch which will not crack at 60 deg. F. or at 32 deg., or even at zero. The makers in using the term "pitch" in this connection always mean oxidized petroleum asphaltum. After some further discussion the specifications were referred back to the committee. This committee recommended a code of arithmetical values for units of interlocking plants, but after some discussion the executive committee was instructed to appoint a conference committee to harmonize these recommendations with those made by other committees.

This committee submitted a code of specifications for electro-pneumatic interlocking filling 35 pages, together with six pages of notes. These specifications were discussed at considerable length and a number of changes in details were proposed by Mr. Rudd and others and were approved by the meeting; but the specifications had been offered by the committee only as a progress report and it was voted that they should be omitted from the permanent minutes of the meeting, so as to avoid cumbering the minutes with unnecessary matter. In connection with this report the president was directed to appoint, with the approval of the executive committee, a committee to deal with all matters in which different committees are likely to make reports which conflict with one another, or which, by covering the same ground, cause unnecessary work.

INDEX TO SIGNAL LITERATURE.

The committee on signal education, W. J. Eck (So. Ry.), chairman, presented a report embodying an index to signal literature, filling about 150 pages, which had been prepared largely by the chairman and Mrs. Eck, Mr. Eck spending many evenings in the Library of Congress and his wife doing editorial work at home. The index proper is made up of references to articles which have appeared in periodicals, the work being brought down to April 30, 1910. Besides this there is a separate list of books, pamphlets and catalogues, arranged under the names of authors or publishers and a list of those educational institutions which give some attention to signaling. This includes a report, in considerable detail, of the work of the School of Railway Signaling at Utica, N. Y. There are also several pages of replies from railway officers, telling what they do in the way of educating men in signaling work. The longest report is from the Union Pacific, with the work of which the readers of the *Railway Age Gazette* are already familiar. Mr. Eck called attention to a number of typographical errors in the report as printed, referring particularly to one on page 163, where the printed matter which has been issued by the School of Railway Signaling should be given as sixteen hundred pages. The committee spent two days at Utica and expresses a very favorable opinion of the school. In regard to education by railway companies, special mention is made of the Pennsylvania and the Union Pacific. Mr. Eck moved, and the meeting adopted, a resolution to accept this index as information and that the index proper be printed in a pamphlet to be sold at a reasonable price (probably \$1, bound in cloth), alternate blank pages to be inserted to enable the owners of books to insert new items as the need may arise. On motion of Mr. Waldron, seconded by Mr. Rudd, a resolution was passed thanking Mr. and Mrs. Eck for their valuable work.

COMMITTEE NO. 1.

Committee No. 1, on signaling practice and standards, presented a report discussing the merits of semaphores working in the upper left-hand quadrant, a subject which was discussed at some length at a meeting last March. Mr. Rudd, chairman of

the committee, moved that it be declared the sense of the association that while upper left-hand quadrant signals are not to be condemned, upper right-hand quadrant signals be recommended for new work and renewals. This motion was carried, the question to be submitted to letter ballot.

On the subject of a complete system of signaling the committee reported as follows:

The letter ballot in last year's report rejected so emphatically the propositions advanced that the committee was somewhat at a loss as to future procedure. The fundamental differences in the viewpoints of the majority and minority, were so pronounced that a unanimous report this year seemed out of the question. Our report, as is the custom, was submitted by Committee No. 10 of the American Railway Engineering and Maintenance of Way Association as its report to that body in March, together with a minority report signed by four members. After considerable discussion it was referred back to the committee, with instructions to confer with the proper committee of the American Railway Association, for decision. The President of the Maintenance of Way Association arranged such a conference which was held at Niagara Falls on June 8. After a hearing, lasting about two hours, the Committee on Transportation [A. R. A.] appointed a sub-committee of three to thoroughly investigate the matter and report its findings to the entire committee, with the understanding that that committee would later advise us what, in their opinion, were the signal indications necessary for proper railroad operation. Our work, on receipt of this report, will, of course, be to recommend to the Maintenance of Way Association the aspects for the display of such indications and we ought to be able to present a unanimous report. Meanwhile, with the conditions prevailing, we have no option but to report progress on this subject.

The sub-committee on standards has adopted specifications for wrought iron pipe, but the subject was inadvertently omitted from the notice of last year, and therefore under the constitution cannot be referred to a letter ballot by the present meeting, but as the specifications have been substantially agreed to by the association, it was voted to submit them to a letter ballot for a tentative vote.

Mr. Rudd, chairman of the committee, moved the adoption and reference to letter ballot of drawings of various standards which had been prepared by the committee and were presented in the report. Action on these was as follows: Semaphore Spectacle design A, approved; Semaphore Spectacle design B, approved; Spectacle Rings, approved. Drawings 1045 and 1046 (two-arm and three-arm semaphores, ground and bracket) approved as standards for spacing but not in all details. Ladders, 1026; Ladder Clamps and Stays, 1029; Ground Signal Masts, 1035, and Cast Iron Base for Bracket and Bridge Signal Posts, 1036, all approved. The designs for Bracket Post and Bridge Signal Masts, 1037, were approved as standards for indicating the height of the arms above the top chord of bridges, but there was considerable discussion over the desirability of having standard drawings showing such signals when the base of the post is fixed to the bottom chord of a bridge. It was the general opinion, however, that standard drawings are not particularly desirable because of the great variety of designs which would have to be considered.

The designs for Lamp Bracket, 1049, for Pinnacles, 1050 and 1051, and for Ladder Foundation, 1052, were approved. Design 1055B, for Porcelain Terminal Block, for use in electric connections, was discussed at considerable length in relation to its size and cost as compared with other designs, but was finally approved by a vote of 20 to 8. The design for a brass washer and nut and for a concrete foundation for a pipe carrier were approved.

The design for a Semaphore Lamp, 1100B, was discussed at considerable length because of differences of opinion as to the most suitable diameter for the lens. Dr. Churchill, of the Corning Glass Works, described at length the merits of a lens $5\frac{1}{2}$ in. in diameter, or $\frac{1}{2}$ in. larger than the standard recommended by the committee. Western roads use a large number of lamps with lenses $5\frac{3}{8}$ in. in diameter, and presumably do not wish to make a change unless there are important reasons for doing so. Dr. Churchill suggested that the standard be "not less than 5 in.," thus leaving anyone free to use a larger size. This is a matter in which a standard is not so important as in some things, because lenses are not frequently changed. The meeting finally voted (with but one negative) that the design

of lamp be accepted, but that the letter ballot to be taken should not be binding in regard to the size of the lens.

On motion of Mr. Rudd the meeting accepted as a progress report the following 12 designs presented by the committee: Ladders (1028A), Cast Iron Base for Bracket Post (1038A), Pipe Bracket Post (1039A), Channel Column Bracket Post (1032A), Ladders for Ground Posts carrying power signals with mechanism at the top of the post (1044), Details of Ladders for Power Signals with mechanism at the top of the post (1047), Details of Ladder Platform Handrails and Stays, for top post mechanisms (1048), Platforms for Bracket Post Deck (1030B), Deck for Bracket Post (1031B), Clearance Diagram for Dwarf Signals between tracks 12 ft. 2 in. apart center to center, traversed by locomotives with very large cylinders (1081A), Semaphore Bearing (1082A), and "U" Bolt and Clamp for Semaphore Bearing (1083A).

The study which had been made by the committee of drawing 1081A showed that for the largest Mallet compound locomotives dwarf signals would have to be set so very low as to be in a position very undesirable for use as a general standard, and the prevailing sentiment of the meeting was that probably two standards would be necessary; and on motion of Mr. Waldron (Interborough Rapid Transit Co.) the committee was requested to prepare two designs. Mr. Mock called attention to the fact that design 1082A would need to be changed to be put in harmony with design B (1041) for a Semaphore Spectacle, but no action was taken and the subject apparently is left with the executive committee.

AUTOMATIC BLOCK SIGNALS.

Committee No. 4, on automatic block signals, A. G. Shaver, chairman, presented codes of specifications for direct current low voltage electric motor semaphore signals; for direct current relays; for trunking, and for caustic soda primary battery cell, the first two codes being revisions of earlier specifications. In moving the approval of the specifications for electric motor signals, Mr. Shaver first called attention to a few changes desired by the committee in the printed report. In paragraph 3, prescribing the designs for one-arm signal, two-arm signal, three-arm signal, etc., the numbers of the designs were cut out, the aim in drafting the specifications being to provide a form which will be useful for an indefinite time, even if the standard designs of signals should be changed. This elision of numbers was carried out through the whole of the specifications. Under paragraph 19, the meeting voted to cut out the requirement that every mechanism must be marked with the purchaser's order number, and also the requirement that the name of the tester should be given. All that is needed is a mark by which he may be identified. Mr. Peabody said that he had found that marks made on paper made with indelible pencil and then covered with varnish were very durable.

After some further discussion concerning the resistance of relays, the meeting approved the specifications for motor signals.

Mr. Shaver next presented the specifications for tinned channel pins, calling attention to a number of typographical errors. The material for pins should have .15 per cent. to .20 per cent. combined carbon. A member suggested that the test of tinning ought to be harmonized with similar tests used on wire, but it was pointed out that the tin on wire is of different thickness, requiring different treatment. Mr. Patenall (B. & O.) has a rail with a thick web and uses pins $1\frac{1}{2}$ in. in diameter. The specifications were approved, with a slight change in the drawing, the difference between the taper with the axis and the total taper was made .014 in. instead of .012 in.

In discussing the specifications for wood trunking it was suggested that these be received only as information and that the executive committee should order that they be harmonized with similar specifications prepared by other committees, but in view of the desirability of having the present specifications available for use, the meeting accepted the view of Mr. Elliott (N. Y. C.) that the harmonizing process be considered later, and the specifications were adopted.

The next thing taken up was the primary battery cell. There was some objection to the nut on the top of the cell (standard design 1070), a thumb screw being claimed to be more convenient for use in cold weather when a man must fix the battery with his gloves on his hands. There was also some discussion over the fact that two manufacturers have patents on some features which are desirable in the standard cell. It was believed, however, that these proprietors of patents would relinquish their rights, and the specifications were finally accepted and ordered to letter ballot, with the proviso that all patent claims must be waived.

Following this action, the meeting reconsidered its action on relays and it was voted that the table showing the limits of resistance in relays should be revised so as to show the maximum reverse pick-up in percentages of the minimum direct pick-up; and it was then voted to refer these relay specifications back to the committee.

At the request of the executive committee, this committee submitted plans of typical circuits for normal clear and normal danger signals, with and without overlap, etc. These drawings were discussed briefly, and the committee was instructed to change them so as to show three-position upper quadrant signals instead of two-position lower quadrant signals.

The committee presented detailed specifications for material in signals, relays, batteries, conductors and many other things, but not in complete form, and these specifications (pages 44-53) were approved as to form, but with the understanding that they should not yet be submitted to letter ballot.

ELECTRIC RAILWAYS.

Committee No. 10, C. C. Rosenberg, chairman, presented a carefully prepared report of about 68 pages, embracing a thorough study of electric signaling for electric railways, including the history of the development of such signaling from the first installation, which was made on the Boston Elevated in 1901. This report was received as information, and will be further noticed in a future issue of the *Railway Age Gazette*.

AUTOMATIC STOPS.

Committee No. 6, on automatic stops and cab signals, Robert C. Johnson, chairman, presented a report, supplementary to that made one year ago on the same subject, and presenting lists of requisites and desirable characteristics which are substantially the same as those presented last year but with improvements in phraseology and certain details. The committee also presented notes on eight schemes for automatic stops or cab signals, which have been considered by it. One of these, the Harrington suspended automatic stop, is in use on the Erie, and another has been tested on the Hightstown & Pemberton in New Jersey. The committee thinks that on the whole considerable progress has been made during the past year, and that railway officers are showing increased interest in automatic stops.

That part of the committee's report describing these inventions was accepted as information. The lists of requisites and characteristics were briefly discussed.

Mr. Ames, discussing requisite No. 2, that apparatus should be proof against failure by the removal of any essential part, spoke of a design, recently brought to his attention, in which the apparatus on the locomotive is so designed that at frequent intervals of space, or of time, it will automatically stop the train, unless by the action of the fixture on the roadway it is prevented from doing this; so that the entire removal of the roadway apparatus would cause the stopping of the train by the absence of the necessary influence on the locomotive.

"Desirable characteristic" No. 5, providing that the engine must be able to run either backward or forward, was ordered transferred to the list of requisites. After some further discussion of details and corrections of a few typographical errors, the conclusion of the committee was accepted and ordered sent to letter ballot in the following form (which omits the last seven words of the sentence as presented by the committee):

That the requisites of installation and desirable characteristics embodied

in this report form an adequate basis on which to design and construct a system of automatic stops and cab signals.

Committee No. 7, C. C. Anthony, chairman, presented a brief report embracing definitions of the terms "Blade-grip" and "Blade," which was accepted and ordered submitted to letter ballot.

This ended the business of the first two days.

THURSDAY.

Committee No. 9, "Wires and Cables," W. H. Elliott (N. Y. C.), chairman, presented a number of codes of revised specifications. Mr. Elliott presented first those for rubber insulated wire for current of 600 volts or less, calling attention to some typographical errors and to changes which the committee had concluded to make in its report as presented. In paragraph 9 the torsion test was cut out. Paragraph 15 should include a provision that the tensile strength at 70 deg. F. must be 1,000 lbs. per square inch. Explaining the changes which had been made in the former specifications, Mr. Elliott said that in paragraph 2 the words "Pure Upriver" had been added. Most of the clauses had been changed only in phraseology and not materially in meaning. Paragraph 8 had been drawn so as to provide for holding wire at the factory until the chemical analysis can be made. Paragraph 11 has been changed so that the sodium sulphide shall have an excess of sulphur. In paragraph 14 the tensile strength has been increased from 800 lbs. to 1,000 lbs. Paragraph 19, prescribing lengths, is believed to best accommodate the purchaser without unreasonable requirements. In the table of resistances, under the head of "Electric Tests of Insulation," the committee had prescribed limits about 25 per cent. higher than those in the former specifications, but finally concluded to withdraw this recommendation, leaving the old limits still in force; this at the request of the manufacturers, who said that they could demonstrate the sufficiency of the old figures. Under paragraph 5 the five-minutes time limit was justified on the ground that as the insulation acts as a Leyden jar, a brief test is not sufficient. In the discussion the committee agreed to introduce in paragraph 7 a provision that tests shall be made "immediately."

Answering criticisms of the standard of specific gravity adopted by the committee, Mr. Elliott said that all samples examined had been found 1.75 or more.

After some further discussion these specifications were approved, to be sent to letter ballot, and the meeting took up the revised specification for weatherproof copper line wire. The committee pointed out some typographical errors in the printed report. In the discussion a letter was presented from Mr. Christofferson (N. J.) saying that much insulation of this kind has proved brittle and unsatisfactory in extremely cold weather. He tests by immersion in a freezing mixture (20 deg. above zero) for 30 minutes and then bends the wire four times around itself. Mr. Shaver tests at 10 deg. above. This is to test the quality of the cotton.

After further brief discussion these specifications were accepted and sent to letter ballot. The same action was taken with aerial braided cables for current of 600 volts or less, these being changed in some details to correspond with the changes which had already been made in the specification for rubber insulated wire.

Next Mr. Elliott moved the adoption of the specifications for galvanized E. B. B. iron bond wires. In these, changes in the wording were made to correspond with the specifications for iron line wire. Mr. Elliott explained that the bending test had been eliminated because it was difficult to get wire which would meet that test. Mr. Shaver tests this wire by bending it around a mandrel $2\frac{1}{2}$ in. in diameter. It was the sense of the meeting that bundles of 300 wires were often convenient in new work, and paragraph 15 was amended to provide that bundles should be made up of 100 wires or 300, as ordered. After some further discussion these specifications were accepted and sent to letter ballot. The same action was taken with revised specifica-

tions for double-braided weatherproof galvanized B. B. iron line wire.

The specifications for rubber insulated lead-covered armored submarine cables for 660 volts or more were next taken up. Mr. Elliott indicated the necessity of the same changes that had been made in the specifications for rubber insulated wire. Mr. Peabody (C. & N. W.) thought that wires in cables need not have insulation of the thickness prescribed by the committee; thinner would be equally satisfactory, as he had found by long experience. It was the sense of the meeting, however, that as the cost of the insulation is so small a part of the total cost of a cable, it is better to be on the side of extreme safety. These specifications were approved and sent to letter ballot. The same action was then taken on the specifications for weatherproof copper-clad wire; on a proposed form for a wire inspection report, and on the tables of insulation resistances given in pages 4 and 5 of the committee's report.

The committee on storage battery, A. H. Yocum, chairman, presented a set of specifications for portable storage batteries in railway signal service, which was received as information, and the committee was directed to continue its investigations.

The special committee on methods of reporting signal failures, J. C. Young, chairman, presented a report embracing proposed blank forms for (1) report of signal failure, to be sent by the engineman or conductor; (2) inspection report; (3) supervisor's report of failures, and (4) a monthly signal report to summarize failures on the whole of a railway or division. After slight changes in the wording these forms were accepted, and ordered printed, but not to be sent to letter ballot. It was the sense of the meeting that the forms should be tried by members before being proposed as association standards. In connection with the discussion on this report, and on motion of Mr. Waldron, the executive committee was instructed to appoint a committee to formulate rules for maintainers.

This was the last report and, after announcement of the election of officers, as given in the *Railway Age Gazette* last week,* the meeting adjourned.

It was voted unanimously to hold the next annual meeting (October, 1911) at Colorado Springs, Colo.

The entertainment features of this convention, including the annual dinner on Wednesday evening, were unusually satisfactory. The committee of arrangements, Charles Stephens, signal engineer of the Chesapeake & Ohio; J. B. Kirtley, C. J. Kelloway and W. J. Eck, provided automobiles and all desirable conveniences for the ladies, and the Chamber of Commerce of Richmond and business men generally were unstinted in their expenditures of time and money for the entertainment of the association.

Charles E. Denney, the new president of the association, is signal engineer of the Lake Shore & Michigan Southern, with headquarters at Cleveland, Ohio. He was born in Washington, D. C., in October, 1879, and was educated at Pennsylvania State College. He left that institution in 1899 and went to work in the shops of the Union Switch & Signal Company, at Swissvale. He continued in the service of that company in various capacities until May, 1905, when he was appointed Assistant Signal Engineer of the Lake Shore & Michigan Southern. He was appointed Signal engineer in May, 1906. He was made a member of the executive committee of the signal association in 1907, and has been prominent in the activities of the association since that time. He is a member of Committee No. 10 of the Engineering and Maintenance of Way Association, which deals with the signaling.

The signal supply association was represented by about sixty manufacturing firms, and the exhibits, a list of which is here given, were indicative of rapid and effective work in the perfection of signaling and allied appliances.

*President, C. E. Denney; second vice-president, B. H. Mann; secretary, C. C. Rosenberg, Bethlehem, Pa.; members of Executive Committee, F. P. Patenall and A. G. Shaver.

Adams & Westlake Co., Chicago. Showing switch, signal and train lamps. Represented by W. H. Baldwin, Assistant General Manager, Chicago; A. S. Anderson, Chicago; C. B. Carson, Chicago; W. J. Pierson, Chicago; H. G. Turney, Chicago; E. L. Langworthy, Eastern Manager, Philadelphia, and F. N. Grigg, Philadelphia.

American Railway Signal Co., Cleveland, Ohio. Represented by G. L. Weiss and H. M. Abernethy.

American Vulcanized Fibre Co., Wilmington, Del. Showing fiber joint plates, fiber end posts, fiber bushings.

Armspear Manufacturing Co., New York. Showing steel lamps and long-time burners. Represented by C. K. Freeman.

Banks Electric & Manufacturing Co., New York. Showing the Banks primary cell. Represented by W. C. Banks and George W. Daves.

L. S. Brach Supply Co., New York. Showing the Brach type 20 lightning arrester, the new type 23 lightning arrester, lightning arrester cabinets, the Victrolac trunking paints, the new Universal die stock and other specialties. Represented by L. S. Brach, H. E. Gifford, and A. G. McClure.

Bryant Zinc Co., Chicago. Showing interlocking relays, crossing bells, indicators, lightning arresters and the Premier electrical instruments. Represented by E. M. Deems.

Buda Manufacturing Co., Chicago. Showing Buda motor cars. Represented by J. L. Artmaier and R. M. Smith.

Central Electric Co., Chicago. Represented by J. M. Lorenz and Charles E. Brown.

Corning Glass Works, Corning, N. Y. Represented by Dr. Wm. Churchill and Fred Cameron.

Commercial Acetylene Co., New York. Represented by R. E. Bruckner and R. P. Steward.

Dixon Crucible Co., Joseph, Jersey City, N. J. Showing paint and pipe joint compound. Represented by Henry W. Chase.

Dielectric Co. of America, Belleville, N. J. Represented by R. T. Hungerford.

Dressed Railway Lamp Works, New York. Showing signal, switch and semaphore lamps, long-time and one-day burners, oil founts and engine and tail marker lamps. Represented by Robert Black, F. W. Edmunds and B. Palmer Clairborne.

Duntley Manufacturing Co., Chicago. Showing the Rockford motor car. Represented by G. E. Graber.

Duplex Metals Co., New York. Showing Copper-Clad line wire, tie wire and Copper-Clad nails. Represented by J. F. Kinder, W. T. Kyle and George P. Fondersmith.

Edison Manufacturing Co., Orange, N. J. Showing the Edison primary cell and a number of novel features in battery construction. Represented by E. E. Hudson, E. W. Brown and F. J. Lepreau.

Edison Storage Battery Co., Orange, N. J. Showing the new Edison storage battery for interlocking and portable use. Represented by H. G. Thompson.

Electric Storage Battery Co., Philadelphia, Pa. Showing the Chloride accumulator, the Exida and Tudor cells and the Permanized negative plate plates and the Permanized Westinghouse negative. Represented by G. H. Atkin, H. M. Beck, H. E. Hunt and Hugh Lesley.

Fairbanks, Morse & Co., Chicago. Showing the new type No. 28 two-cycle gasolene engine motor car, the type 2-J motor car and a new bonding drill. Represented by A. A. Taylor, J. L. Jones, W. W. Adams and C. T. Fugitt.

Federal Signal Co., Albany, N. Y. Represented by John T. Cade, Harry Cade and Aaron Dean.

Galena Signal Oil Co., Franklin, Pa. Showing signal and headlight oils. Represented by John W. Bunn.

General Electric Co., Schenectady, N. Y. Showing A. C. and D. C. relays, tower indicators, mercury time release, resistance units, panel boards and testing instruments. Represented by Frank Rhea, F. B. Corey, H. K. Ferguson and C. H. Jones.

Gould Storage Battery Co., New York. Showing signal batteries. Represented by George R. Berger.

General Railway Signal Co., Rochester, N. Y. Represented by H. M. Sperry, Morris Wuerpel, F. O. Poor, F. L. Dodgson, L. Thomas, Mark Briney, W. P. Graves and M. F. Geer.

Graselli Chemical Co., Cleveland, Ohio.

Gray & Sons, Peter, Boston, Mass. Showing switch, signal, bridge and tail marker lamps, burners, including new automatic electric burners and acetylene gas burners and founts. Represented by George M. Gray, J. M. Brown and J. F. Leonard.

Hall Signal Co., New York. Represented by W. H. Lane, Harry L. Hollister, G. W. Hovey, W. A. Peddle and H. J. Mullineaux.

Hazard Mfg. Co., Wilkes-Barre, Pa. Represented by R. A. Peet.

Kerite Insulated Wire & Cable Co., New York. Represented by R. D. Brixey, Azel Ames, P. W. Miller, G. V. Watson, R. A. Patterson and J. A. Renton.

Lawrence Electric Co., F. D., Cincinnati, Ohio. Represented by Charles F. Noloth.

Lutz-Lockwood Co., Aldene, Union County, N. J. Represented by W. M. Kinch and George Marloff.

Lauder & Patterson, New York. Represented by H. K. Patterson.

Macbeth-Evans Glass Co., Pittsburgh, Pa. Showing lenses for switch and signal lamps. Represented by J. M. Barnett.

Massey Co., C. F., Chicago. Represented by C. F. Massey.

National Carbon Co., Cleveland, Ohio. Showing the Columbia dry cell, the new multiple battery, the Columbia track battery and battery specialties. Represented by M. H. Moffett and E. L. Marshall.

National India Rubber Co., New York. Represented by Avery P. Eckert.

Okonite Co., New York. Represented by John Langan.

Pocket List of Railroad Officials, New York. Represented by J. Alexander Brown.

Rail Joint Co., New York. Represented by Fred A. Poor, V. C. Armstrong, R. W. Smith and E. F. Schermerhorn.

Railroad Supply Co., Chicago. Showing locomotive and standard types of crossing bell, battery supplies, channel pins, bonding tools, fiber and aluminum tags, new model 2 switch box and hand-controlled circuit breakers. Represented by E. W. Vogel, H. M. Buck and J. F. Leonard.

Railway Specialty & Supply Co., Chicago. Showing the Arc-damp, lightning arrester, the P. M. rail anchor and bond wire protectors. Represented by Phillip Moore and L. W. Kent.

Roller-Smith Co., Bethlehem, Pa. Showing electrical measuring instruments. Represented by H. I. Shire and W. J. Shire.

School of Railway Signaling, Utica, N. Y. Showing the instruction pamphlets and books of the school. Represented by Fred Lavarack and H. C. Williams.

The Signal Engineer, Chicago. Represented by E. A. Simmons, B. B. Adams, A. D. Cloud, L. B. Mackenzie, Fred W. Bender, C. R. Mills and W. D. Horton.

Simplex Electrical Co., Boston. Showing signal wires and cables.

Standard Underground Cable Co., Pittsburgh, Pa. Showing Colonial copper-clad wire. Represented by H. P. Kimball.

Union Switch & Signal Co., Swissvale, Pa. Represented by J. G. Schrueder, J. S. Hobson, S. G. Johnson, George Blackmore, W. M. Vandersluis, T. H. Patenall, M. D. Hanlon, L. F. Howard, H. C. McCready, W. H. Cadwallader, W. H. Fenley, J. P. Coleman and C. Coleman.

Universal Metallic Tie Co., Salt Lake City. Showing the Universal metallic tie.

United States Light & Heating Co., New York. Represented by W. P. Hawley and W. F. Bauer.

Waterbury Battery Co., Waterbury, Conn. Showing new types of Schoenmehl primary cells. Represented by C. B. Schoenmehl and C. L. Schoenmehl.

Watson Insulated Wire Co., Chicago. Represented by J. V. Watson and R. A. Patterson.

Western Electric Co., Chicago. Represented by Geo. H. Porter.

Whall & Co., C. H., Boston, Mass. Represented by C. H. Whall.

Yale & Towne Manufacturing Co., New York. Showing signal locks and padlocks. Represented by C. H. Van Winkle.

MR. MCCREA ON RAILWAY FINANCES.*

The Pennsylvania system east of Pittsburgh has cost very much more than the capitalization represents. On that capitalization it has never paid more than a fair return—less, in fact, than most other characters of investment, such as manufacturing, mining and agriculture. The results of constant increases in its business have been distributed either through reductions in rates, increases in amounts paid for wages and material, or by reinvestments in the property not capitalized. It has always been typical of good and constantly improved service—in fact, the character of service which, if I understand the American people, they desire perpetuated and improved. A railway system of this character being so capitalized and rendering a service which is not only of the highest character, but satisfactory to the public and to its patrons, deriving as it did in the year 1909 net earnings to the amount of but 5.01 per cent. of the amount actually invested in the property, it is difficult for me to understand how a system of rates which secures such results can be regarded as on too high a basis.

The Pennsylvania Railroad Company has for many years past, as a result of its operations, realized a substantial surplus in each year over and above the amount required to enable it to meet its interest charges and pay moderate dividends on its stock to its stockholders. This surplus has varied in amount from year to year. For the last ten years the average has been about \$12,000,000 a year, practically all of which has been expended on the property for the purpose of enabling the company to conduct its operations more safely, more efficiently and more cheaply.

Since the passage of the Interstate Commerce Act in 1887 the amounts expended on the property of the lines east of Pittsburgh out of the earnings and from other sources than the proceeds of the sale of bonds or stock or other securities aggregate \$262,000,000, and the company was enabled to provide almost all of this large sum out of the surplus earnings derived from the operation of its property. The Pennsylvania Railroad and many of the roads embraced in its system were built at a time when it was difficult to secure capital for such enterprises. The country through which the roads were built was at that time comparatively thinly settled and the business light. The character of the construction, which was suitable for the time and the existing conditions, was, to a large extent, unsuited to later conditions. The safety of the public and of employees required elimination of grade crossings of highways, the use of safety appliances and the use of improved material and equipment, all of which in themselves do not yield much, if any, net return, and it was to meet these conditions and to adapt its road and equipment to modern requirements that the uncapitalized earnings in

*Testimony of James McCrea, president of the Pennsylvania Railroad, before the Interstate Commerce Commission, at Washington, October 12.

the form of surplus have been so freely spent. Had these earnings not been available, and had they not been expended for the purposes indicated, the Pennsylvania Railroad would to-day be a very different railway and would have been wholly unable to render the service to the public which it is to-day rendering. The accumulation of the surplus earnings which have been thus expended has only been possible because the rates of freight in force since the passage of the Interstate Commerce Act have been sufficient to realize for the company amounts in excess of its expenses, taxes, interest and dividends.

The fact that these surplus earnings were being earned in each year has not been a matter that has been concealed from the public, but, on the contrary, the existence of the surplus and the disposition made of it have not only been public property, but the method or practice pursued by the company in providing in part, at least, for the necessary additions to and improvement of its property in this manner has been generally and publicly commended and approved. It is vitally important that in the future the company should be enabled to continue to pursue the policy which has guided it in the past, and to provide in part, at least, for future additions and improvements out of surplus earnings. It is fairly to be expected that the company will be required to make as great expenditures in the future as it has made in the past. An enormous amount of work remains to be done, for which additional funds will have to be secured. The public of to-day is demanding a service of a far more costly character than ten or twenty years ago was expected or desired, and in order to make the improvements required to meet the constantly increasing demands of this character and to furnish a service which, according to modern views and standards, the public, in a sense, has a right to ask for, large expenditures must continue to be made upon the property, and if this company is to meet these conditions and is to continue to progress and not to go backward (because there is no such thing as a large railway system standing still), it must continue to derive earnings from its operations, not merely sufficient to enable it to make a fair return to its stockholders, but sufficient to earn a surplus which can be expended on the property sufficiently large to maintain the credit which it has established.

In the last ten years the Pennsylvania Railroad Company has expended upon its property out of income upward of \$116,000,000 and has also secured, through the sale of its stock, exclusive of premiums, to the amount of about \$275,000,000, and through the increase of its bonded debt, exclusive of car trusts (\$25,000,000) of about \$172,000,000. Its ability to sell its stock and bonds has been due to the fact that it has not merely paid dividends of 6 per cent. or 7 per cent., chiefly the former, but that it has been able to show at the end of the year large surplus earnings, which it has put back into the property.

When investors have been asked to purchase its stock or bonds the company has been able to show that it was then in receipt of enough income to enable it to make a fair return on the securities that it proposed to issue, even if the proceeds of these securities could not be so invested as to enable the company to derive an immediate return thereon. In other words, the existence of the surplus earnings established a credit which enabled the company to secure the additional funds necessary to make improvements or additions as these became necessary.

What would have been the condition if the company's earnings had been so restricted in the past as to prevent it from accumulating surplus earnings available for the improvement of its property? If the \$262,000,000 which has been thus expended on the lines east of Pittsburgh had been realized through a sale of securities these securities would have had to have been sold at a price which could have been realized for them, and if the earnings of the company had been such as to barely cover the amounts required to meet its interest and dividends on its then outstanding securities, the prices realized for any additional issues of securities would have been such that the additional charges to which the company would have been subjected would have to-day necessitated rates higher than those which have been prevailing,

in order to enable the company merely to meet its interest and dividend charges.

But there is another feature to be borne in mind in this connection, and that is that a large part of the \$262,000,000 thus expended upon the property has been spent for purposes which would hardly justify an increase of its capital. Take, for instance, the amounts expended in changes of line in order to eliminate curves or to reduce grades. In almost all cases of expenditures of this character the old line is abandoned. Take, also, the large amounts which have been spent in the elevation of the railway through cities and many other items of a like character. Expenditures of this character, which do not result in any additions to the property which would tend to increase its gross earnings or revenue, ought not, where it is possible to avoid it, to be treated as capital expenditures.

During all the period that these large expenditures were being made—mainly out of surplus earnings—one of the main purposes that the company had in view was the reduction in the cost of transportation. Throughout this period the general trend of wages has been upward, and the same has been true of its taxes and of many other items which enter into and affect operating cost. Increased cost resulting from these features has been largely met by the reduction in cost resulting from expenditures made for this purpose, and thus it has been possible to avoid constant and frequent increases in rates of freight which otherwise would have had to have been made in order to enable the company to meet its increased operating cost.

In the present year the expenses of the companies whose lines are embraced in what is known as the "Pennsylvania lines east of Pittsburgh" have increased, due to an increase in the rate of wages paid to their employees, between \$7,000,000 and \$8,000,000 per year, and it is necessary for this company in some way to recoup itself for this additional tax on its income. Heretofore in similar cases this has been accomplished partially by advances in rates and partially through economies resulting from reductions in grades, increased hauling capacity of locomotives, increased capacity of cars and increased volume of business.

So far as concerns economies which will result from reductions in grades, increased hauling capacity of locomotives and increased capacity of cars, the companies are to-day already practically deriving the full benefit from those which are possible in this direction, due to expenditures heretofore made, for we have practically completed our grade reductions and have probably reached the maximum size for our cars and engines. And it is to be borne in mind in this connection that we are now largely unable to secure the benefit of increased economies resulting from larger engines and cars and reduced grades with respect to our preference freight trains, in which the merchandise class traffic as a rule is transported, due to the fact that the amount hauled by these trains is limited by higher speed and the maximum grades over which they must pass, this being necessary in order to avoid the breaking up of the trains at transfer points.

For the last three years there has been practically no growth in business. The records of 1910 will show that the business of that year is below that of 1907. I do not mean that it should be inferred from this that there is not, in my opinion, going to be any future growth in business, but east of the Mississippi, at least in my judgment, it is going to be at a markedly slower rate than in the past, and with that growth will probably come a diminishing length of haul, thereby tending to reduce the gross earnings of the companies. But even if our gross earnings are to continue to grow as the result of growth in business, the additional net earnings that will be derived from the increased business will in all probability fall very far short of making good the additional cost put upon the companies by the wage increase.

That this is true is largely demonstrated by the results of the company's operations for the five months following the advance in wages. In these five months the gross earnings of the lines east of Pittsburgh increased about \$6,700,000, while the net earnings (including in the expenses expenditures heretofore made for additions and betterments, in order to enable a comparison

to be made with last year, when expenditures of the same character were also included in operating expenses) decreased about \$3,000,000. Treating these months as typical months—and there is no reason why they should not be regarded as such—and extending the figures so as to embrace a year's business on this basis, the result would be that with increased gross earnings of about \$16,000,000, there would be a decrease in the net earnings of about \$7,200,000. The results of the five months' operation already referred to have also shown that (treating again the expenditures heretofore made for the additions and betterments as part of the operating expenses, in order to enable a comparison to be made), the operating ratio has risen from 69.70 per cent. in 1909 to 75.51 per cent. in 1910, an increase of almost 6 per cent. There is no reason, in my judgment, for expecting that further increases of gross earnings will tend materially to reduce this operating ratio, except to the extent to which increased rates of freight will tend to do this. The company will therefore in the future be obliged to expend for operating expenses probably not less than 75 per cent. of any increased earnings which it may derive, but the 25 per cent. which will be thus left will not represent surplus earnings; thus, for example, gross earnings of the Pennsylvania Railroad Company in the year 1909 exceeded those for the year 1900 by about \$66,000,000 the operating expenses, including taxes, increased \$52,000,000 and the net earnings about \$14,000,000.

But in this same period the investment of the company in the property from which this income was derived had increased to the extent of \$288,000,000. Interest on this amount at the rate of 6 per cent. would be more than \$17,000,000, so that of the increased earnings of 1909, which, as has been already said, amounted to \$66,000,000, \$52,000,000 was absorbed by operating expenses and taxes, leaving \$14,000,000 net earnings, or \$3,000,000 less than the interest on the amount necessary to secure them.

In my judgment, therefore, it would be wholly unsafe to assume that the company will, as the result of the growth of its business, be enabled to recoup itself for the depletion in its surplus revenue, which is certain to result from a continuance of the present operating cost. Under these conditions I feel that it is essential, in the interest of the public and of shippers, as well as of the railway company itself, that it should be permitted to secure through an advance in rates the amount which represents its additional outlay on account of the advance in wages in order that its surplus earnings may continue at approximately the rate at which they have been running in the past. It will require the expenditure of more than these surplus earnings to enable the company to keep pace with the demands of the public and of its shippers, and unquestionably additional capital must be secured in the future. If we are to obtain this we must not only be in a position to make a fair return on it, but we must be able to show a margin of safety in our earnings.

I believe, generally speaking, that what I have said in regard to the Pennsylvania Railroad as to the necessity for the rate advance is equally true of almost all railways in the United States, certainly those which are conservatively managed and which are endeavoring to give the public such a service as they have a right to expect.

THE STREET RAILWAY EXHIBIT.

One of the interesting points to be noted in connection with the exhibit at the street railway convention at Atlantic City last week was the close affiliation that there seems to be between the manufacturers that deal almost exclusively in electrical machinery and the makers of some purely mechanical specialty which, it would seem, might well be bought in the open market of whomsoever might come along. An example of this is to be found in the matter of armature shaft pinions. There has been so much trouble with breakage and the proper operation of the motor is so dependent on pinion conditions that one of the large companies manufactures its own, with an elaboration of detail and care that few would imagine possible

or necessary. In addition to this they are constantly experimenting in order to improve the quality of the goods if possible. One of the lines along which this experimentation is working is that of producing a hard case-hardened surface over a soft steel core. Case hardening is old, but, as usually practised, it produces a mere skin $\frac{1}{8}$ in. or possibly $\frac{1}{4}$ in. thick. This new method, on the other hand, is driving the carbon in until the skin is $\frac{1}{8}$ in. or $\frac{1}{4}$ in. thick, or even more. It is a new development in the heat treatment of steel that probably owes its origin to the demands on the part of electric railways for a pinion that has an exceedingly hard wearing surface backed by a soft, tough, ductile metal that can withstand the shocks and stresses to which the parts are subjected.

In like manner, too, that hard material, manganese steel, has received one of its widest, if not its widest, application in street railway work. So successful has it been in cutting down the cost of maintenance of special work that it is now taken for granted that it will be used in any well-constructed line, while it may also be said that, in some cases, the use of manganese steel rails on curves has made the operation of a road possible. Although it may have been the case of a good wine needing no bush, the applications of the metal are some of them new, and it was undoubtedly well to drive it home to those few who are not familiar with the many uses to which it can be put; hence the exhibit of the various types of crossings, rails and switches.

It is interesting, too, to note what an evident hold the solid steel wheel has on the electric railway men, when it is remembered that it is only a few years since the first solid steel wheel was put on the market, and that, at first, it was considered of doubtful economic value. The dangers to passengers from a wheel failure on an ordinary urban railway are practically nil, so that the widely extending adoption of the steel wheel for that class of work must be the result solely of economic forces. There is no doubt but that it is gaining ground rapidly and is fast pushing the cast wheel to the wall for heavy work; and the fact is emphasized by the number and types of steel wheels that were exhibited at Atlantic City.

In the whole exhibit there was no neglected department and every officer and employee of every street railway in the country could have found something on the pier that should have interested him and interested him deeply. That this was so and that the value of the exhibit was appreciated is shown by the fact that the busy men of the engineering section thought it worth while to stop their convention work for a whole day in the midst of their sessions and devote it to the examination of the exhibits. It was a wise and graceful step, and one which not only enabled them to gain much that was of value, but acted as an encouraging stimulant to the exhibitors.

It is perhaps useless to comment on the arrangement of the exhibit. The growth at Atlantic City has been phenomenal and it is difficult to see how the arrangements could be improved. As at the June exhibit, the committee having the matter in charge have it so well in hand that the exhibits are arranged, not only so as to be thoroughly accessible and easily found, but in such a manner as to appeal to the eye and be called artistic, not only in individual cases but as a whole. As one lady expressed it: "Who would have thought that men could have taken a lot of wheels and things and make them look as they do?"

The following were among the firms represented:

Adams & Westlake Company, The., Chicago.—Car hardware, electric headlights, oil and electric signal lamps, hand lanterns, brake handles, etc. Represented by B. L. Compton, J. W. Foster.

American Brake Shoe & Foundry Company, Mahwah, N. J.—Brake shoes, association standard. Represented by F. W. Sargent, W. S. McGowan, E. L. Jones, R. E. Holt, F. L. Gordon, J. B. Thompson.

American Hoist & Derrick Company, St. Paul, Minn.—Moving pictures of company's machinery used in railroad work. Represented by W. L. Manson, F. J. Johnson and W. O. Washburn.

American Railway Supply Company, New York.—Conductor and motorman cap and coat badges; employee cap and coat badges; uniform buttons, police badges, etc. Represented by Walter Chur.

American Rolling Mill Company, Middletown, Ohio.—American ingot iron rust-resisting products, such as railway culverts, roofing, plates, boiler tubes, etc. Represented by G. H. Charls, G. F. Ahlbrandt.

Baldwin Locomotive Works, Philadelphia, Pa.—One heavy interurban truck for the Southern Pacific Company (Alameda electrification), class 84-35-S; one light city truck for the Shore Line Electric Railway, class

54-18-F-2. Represented by J. R. Dickey, S. A. Bullock, C. H. Peterson, C. F. Dodson.

Berry Brothers, Limited, Detroit, Mich.—Varnishes. Represented by Major Robert E. Mills, George M. Kerr, Ferdinand W. Hormann.

Carnegie Steel Company, Pittsburgh, Pa.—Schoen steel wheels, steel axles, vanadium steel, steel ties, Duquesne joints, special welding steel, sections of rolled steel. Represented by N. M. Hench, J. C. Neale, W. A. Bostwick, J. C. C. Holding, C. G. Bacon, Jr., N. B. Trist, J. P. Noonan, L. P. Lincoln, L. H. Bowman, C. L. Wood, Robert Coe, V. S. Yarnall, W. E. Berry, K. E. Porter, F. C. Brunke, F. E. Spencer, W. H. Scanlan.

Chicago Pneumatic Tool Company, Chicago.—Electric drills, electric track drills, grinders, spike driving apparatus; pneumatic drills and hammers and electrically driven air compressors. Represented by Thomas Aldcorn, C. B. Coates, George Barden, Edward Aplin.

Cleveland Frog & Crossing Company, Cleveland, Ohio.—“Hard Service” manganese frog; combination “Hard Service” manganese and regular rail crossing; switch with “Hard Service” manganese point; “Hard Center” manganese switches, mates and frogs; “Hard Center” manganese crossing; Porter derailing switch; C. C. switch locking device; switch attachments, etc. Represented by G. C. Lucas, L. G. Parker, Geo. Arnold, Jr., Geo. Stanton, S. Balkwill, Jr., A. P. Ruggles.

Consolidated Car-Heating Company, New York.—Electric heaters and switches for pressure up to 1,200 volts, door-opening devices, buzzer systems, electric relays, electric resistance tubes, automatic train signals. Represented by Cornell S. Hawley, Thomas Farmer, Jr., W. S. Hammond, Jr., H. L. Hawley.

Crocker-Wheeler Company, Ampere, N. J.—Photographic views of railway generators, power transformers, motor-generator sets, etc. Descriptive bulletins of Crocker-Wheeler electric railway apparatus. Represented by J. R. Wilson, Rodman Gilder, Clarence E. Delafield.

Curtain Supply Company, Chicago.—Ring No. 88 fixtures, Ring No. 89 fixtures for open or closed cars, curtain materials. Represented by W. H. Forsyth, R. F. Hayes, S. W. Midgley.

Dearborn Drug & Chemical Works, Chicago.—Scientific treatment for boiler feed waters, prepared to suit conditions shown by analyses of the waters. Represented by George R. Carr, Grant W. Spear, H. G. McConaughy.

Dixon, Joseph, Crucible Company, Jersey City, N. J.—Lubricating graphite, foundry facings, graphite crucibles, graphite curve grease, graphite wood grease, graphite brushes, pencils, graphite air brake grease, silica-graphite paint, marking crayons, belt dressings, graphite gear grease, graphite car box grease, graphite commutator compound. Represented by J. J. Tucker, J. M. Willits, J. A. Condit, R. Belleville, H. W. Chase, Wm. McIntosh, L. H. Snyder.

Drouvé, G. Company, Bridgeport, Conn.—Sample car house, “Anti-Pluvius” puttyless skylight and “Straight-Push” sash operator applied to steel sash, showing control. Represented by William V. Dee.

Duff Manufacturing Company, Pittsburgh, Pa.—Barrett track and car jacks, geared ratchet lever jacks, Duff ball-bearing screw jacks, Barrett motor armature lifts, car replacing traversing bases and Duff-Bethlehem hydraulic jacks. Represented by T. A. McGinley, G. A. Edgin, E. A. Johnson, E. P. Hess.

Edison Storage Battery Company, West Orange, N. J.—Edison storage battery in detail. Represented by D. C. Arlington.

Edwards Company, The O. M., Syracuse, N. Y.—Window fixtures, extension platform steel trap doors, metal sash, tin barrel spring rollers, padlocks, metal office furniture. Represented by O. M. Edwards, Edw. F. Chaffee, C. H. Rockwell, W. C. Bradbury, T. P. O'Brian.

Electric Storage Battery Company, Philadelphia, Pa.—Street railway switchboard panel with new average adjuster; illustration of new oil insulator for batteries in lead-lined tank; samples of positive and negative plates; details of storage battery apparatus. Represented by Charles Blizard, G. H. Atkin, H. B. Gay, Edward L. Reynolds.

Galena-Signal Oil Company, Franklin, Pa.—Reception booth. Represented by C. C. Steinbrenner, E. V. Sedgwick, Geo. A. Barnes, L. R. Speare, E. H. Baker, F. A. Guild, C. H. Inomas, W. A. Trubee, L. J. Drake, Jr., C. A. Record, F. R. Stakelum, A. O. Fletcher, W. A. McWhorter, E. G. Beatty, H. C. Mason, Geo. J. Smith, J. E. Southwell, C. L. Richards, J. C. Glair, W. A. Love, W. O. Steiff, E. M. Hedley, Alfred Green, John A. Wilson.

General Electric Company, Schenectady, N. Y.—Curtis turbine; Type “M” control equipment; railway motors; rotary converter panel; emergency straight air brake equipment; electro-brake equipment; railway line material; rail bonds, recording steam and air flow meter; indicating steam meter; magnetite arc headlight; controllers; switches; rheostats; motor-man's valves, etc. Represented by J. G. Barry, W. J. Clark, W. B. Potter, C. C. Peirce, S. W. Trawick, R. E. Moore, E. H. Ginn, H. S. Monroe, G. D. Rosenthal, H. C. Marsh, R. I. Cash, H. M. Winter, H. C. Glaze, F. E. Case, E. D. Priest, G. H. Hill, W. G. Carey, Frank H. Gale.

Gold Car Heating & Lighting Company, New York.—Electric heaters, car ventilators. Represented by Edward E. Gold, E. B. Wilson, J. M. Stayman, F. H. Smith, F. Cahill.

Gould Storage Battery Company.—Car at the entrance of pier equipped with 58 type T-H-29 storage cells. At booth, grids and batteries and photos of Detroit River tunnel installation. Represented by Dr. W. E. Winship, W. S. Gould, G. C. Hayes, Fred Booss.

Grip Nut Company, Chicago.—“Grip Lock” nuts, square and hexagon. Represented by J. W. Hibbard, E. R. Hibbard, B. C. Wilt.

Indian Refining Company, Inc., Cincinnati, Ohio.—Electric railway lubricating oils. Represented by J. V. Smith, A. J. Varrelmann, I. B. Connor, T. U. Franklin.

Jones & Laughlin Steel Company, Pittsburgh, Pa.—Cold rolled axles, spikes, chains, structural sections, bars, cold twisted steel bars, steel sheet piling, cold rolled sections. Represented by E. D. Batchelor, Frank S. Slocum, George B. Mitchell.

Johns-Manville, H. W., Company, New York.—Overhead material; rail bonds; high voltage transmission insulators and fittings; fibre conduit “Noark” service and subway boxes and car fuse boxes for motor protection; dry batteries; fibre retainers for 60,000 volt oil switches; ebony asbestos wood for switchboards; plain asbestos wood for street car construction; friction tape and splicing compound; “Linolite” illuminating devices. Represented by J. W. Perry, G. R. Saylor, H. M. Frantz, R. R. Braggins, H. M. Voorhis, W. H. Robinson, E. B. Hatch, R. C. Buell, A. E. Brown, R. B. Lattin, A. G. Newton, R. C. Cole.

McConway & Torley Company, Pittsburgh, Pa.—Janney radial coupler equipment, the McConway steel tired wheel. Represented by Stephen C. Mason, E. M. Grove, H. C. Buhoup, J. H. Milliken.

Nachod Signal Company, Philadelphia, Pa.—Automatic signal connected for operation with miniature track; high speed trolley contactor; relay unit. Represented by Carl P. Nachod, Fred W. Kulicke.

National Lock Washer Company, Newark, N. J.—Car curtains, curtain fixtures, sash balances, sash locks, lock washers. Represented by W. C. Dodd, F. B. Archibald, John B. Seymour, Daniel Hoyt, J. Howard Horn.

National Tube Company, Pittsburgh, Pa.—Shelby seamless cold-drawn steel trolley pole and welded trolley pole. Represented by J. G. Bateman.

New York Switch & Crossing Company, Hoboken, N. J.—T-rail, anti-straddle tongue switch for interurban service; girder rail, anti-straddle tongue switch with right or left hand spring adjustment; girder rail mate, hard center construction; girder rail crossover frog; 90 deg. street railway crossing with renewable centers. Represented by W. C. Wood, H. R. Sherman.

Pantasote Company, New York.—“Pantasote” upholstery and curtain material; “Acasote” headlining. Represented by John M. High, W. A. Lake, A. S. Barrows.

O M S Company, Plainfield, N. J.—Stanwood steel car steps, Stanwood steel folding car step, hand power traveling crane of 3-ton capacity, hand racked trolley, No. 6 style air-balanced load-retaining air hoist, pneumatic pit jack. Represented by C. H. Holbrook.

Rail Joint Company, The, New York.—Weber, continuous and Wolhaupter rail joints. Represented by L. F. Braine, Mr. McCaskey, W. A. Chapman, E. A. Condit, P. Holbrook, G. W. Smith, W. E. Clark, H. C. Holloway.

Ramapo Iron Works, Hillburn, N. Y.—Full automatic-parallel-throw safety switch stands, automatic return safety switch stands, manganese reinforced switch point, solid rolled riser plates, guard rail clamps with adjustable and reversible filler blocks. Represented by W. B. Lee, A. Gemunder, G. E. Haring, W. W. Snow, J. Edgar Davidson.

Roebblings' Sons Company, John A., Trenton, N. J.—Bare wire, wire rope and fittings, wire cloth and netting, insulated electrical wires, cables. Represented by W. P. Bowman, A. B. Conover, U. G. Tingley, M. R. Cockey, G. R. Swan, W. L. Doyle, A. D. Clarkson, A. V. Errickson.

Standard Coupler Company, New York.—Brake shoe slack adjuster (“shim slack adjuster”). Represented by E. H. Walker, C. D. Jenks, W. H. Sauvage.

Standard Paint Company, New York.—P. & B. and S. P. C. insulation varnishes, compounds and tape; “Flexite” and other preservative paints. Represented by Charles E. Smith, H. A. Inwood, H. E. Lavelle.

Standard Steel Works Company, Philadelphia, Pa.—Steel-tired wheels, rolled wheels, open-hearth steel hammered axles. Represented by E. S. Lewis, C. R. Dodson, A. R. Green, C. H. Petersen, T. W. Weston.

Sterling Varnish Company, Pittsburgh, Pa.—Insulating varnishes, iron enamel paints, raw refined linseed oil, tank for dipping car fenders. Represented by A. S. King, W. V. Whitfield, W. F. Hebard.

Symington, T. H., Company, Baltimore, Md.—Journal boxes, center bearings, side bearings, flexible dust guards. Represented by J. F. Symington, C. J. Symington, W. W. Rosser, A. H. Weston.

Underwood, H. B., & Company, Philadelphia, Pa.—Portable cylinder boring bar set up ready for operation in a small cylinder; portable crank in turning machine set up on a crank in operation. Represented by D. W. Pedrick, 2nd.

United States Electric Signal Company, West Newton, Mass.—Automatic block signal, automatic block recording signal, highway crossing signal, “Usesco” rail sander. Represented by Roland F. Gammons, 2nd, John J. Ruddick, William W. Harrington, J. Warren Putnam.

U. S. Metal & Manufacturing Company, New York.—“Diamond” steel poles, Wolfe automatic rail joint lock, “Columbia” lock nuts, paints and varnishes, wood preservative, Cunningham axle. Represented by R. A. Hegeman, Jr., Chas. C. Castle, Edw. D. Hillman, F. C. Dunham, H. A. Hegeman, Arthur Masters.

Walker & Bennett Manufacturing Company, New York.—Stationary and reversible car seats for city and interurban service; also longitudinal cushions and backs made with steel frames. Represented by Sheridan A. Walker, K. D. Hequembourg.

Watson-Stillman Company, New York.—Portable hydraulic punch, 3000-lb. telescopic motor lift, 10-ton telescopic jack, 35-ton hydraulic rail bond compressor, section of 30-ton hydraulic jack, “Noscalon” machine for feeding, “Noscalon” boiler water treatment. Represented by Geo. L. Gillon, Edwin Stillman, Frank H. Clark, Robt. T. Weaver.

Western Electric Company, New York.—Telephone sets, including portable telephones and inter-phone sets, transmitters and receivers, selectors, relays, coils, condensers, transmitter arms, line poles and jacks, protectors, batteries, bells and buzzers; car equipment material, including commutators, registers, trolley poles, car wheels, headlights, gongs and bells, high tension switches, “Hawthorn” soldering salts and paste; line material, including trolley frogs, crossing, strain insulators; “Electro” material of many kinds, mounted on display boards and high tension insulators; “Hawthorn” flaming arc and a line of incandescent lamps. Represented by F. D. Killian, J. L. Ludwig, W. R. Lyall, D. C. Guest, R. P. Miller, M. A. Oberlander, E. D. Himan, H. B. Sullivan, R. H. Harper.

Westinghouse, Church, Kerr & Company, New York.—Copies of booklet “Work Done.”

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa. Railway motors, controllers, circuit breakers, repair parts. Represented by S. L. Nicholson, C. S. Cook, C. H. Davis, M. C. Lambert, J. J. Sinclair, W. J. Conwell, Thos. Cooper, H. C. Stier, J. C. McQuiston.

Westinghouse Lamp Company, Bloomfield, N. J.—Railway incandescent lamps. Represented by Walter Cary, T. G. Whaling, B. F. Fisher.

Westinghouse Machine Company, East Pittsburgh, Pa.—Le Blanc condenser, complete with turbine, motor and air pumps. Represented by E. H. Sniffin, H. Van Blarcom, L. L. Brinsmade, H. P. Childs.

Westinghouse Traction Brake Company, Wilmerding, Pa.—No. 5 electro-pneumatic brakes, schedule AMM automatic brakes, electric pump governors, automatic car and air coupler, motor-driven air compressors. Represented by A. L. Humphrey, W. V. Turner, W. S. Bartholomew, J. R. Ellicott, E. L. Adreon, E. A. Craig, R. P. Noble, H. S. Clark, P. H. Donovan, R. E. Adreon.

Wharton, Wm., Jr., & Company, Inc., Philadelphia, Pa.—Switches, mates and frogs of solid manganese steel construction and of manganese steel center construction; spring and locking devices for tongue switches; solid manganese steel crossings and manganese steel T- and girder rails, the girder section having been in service nearly seven years. Represented by V. Angerer, L. R. Ashhurst, Jr., R. C. McCloy, H. F. McDermott, George R. Lyman, J. C. Robinson, F. H. Osborne, A. S. Partridge, J. E. McLain.

Wheel Truing Brake Shoe Company, Detroit, Mich.—Abrasive brake shoes. Represented by J. M. Griffin.

Yale & Towne Manufacturing Company, New York, N. Y.—Chain blocks, electric hoists, carrying trolleys, cranes. Represented by C. W. Beaver, H. C. Spaulding, R. T. Hodgkins.

CAR-TRAVERSING BALLAST LOADER.

The ballast loader shown in the photographs was designed by E. J. Beard while he was chief engineer of construction for J. G. White & Co., New York, in charge of building the Philippine Railways. We are indebted to him for the following description:

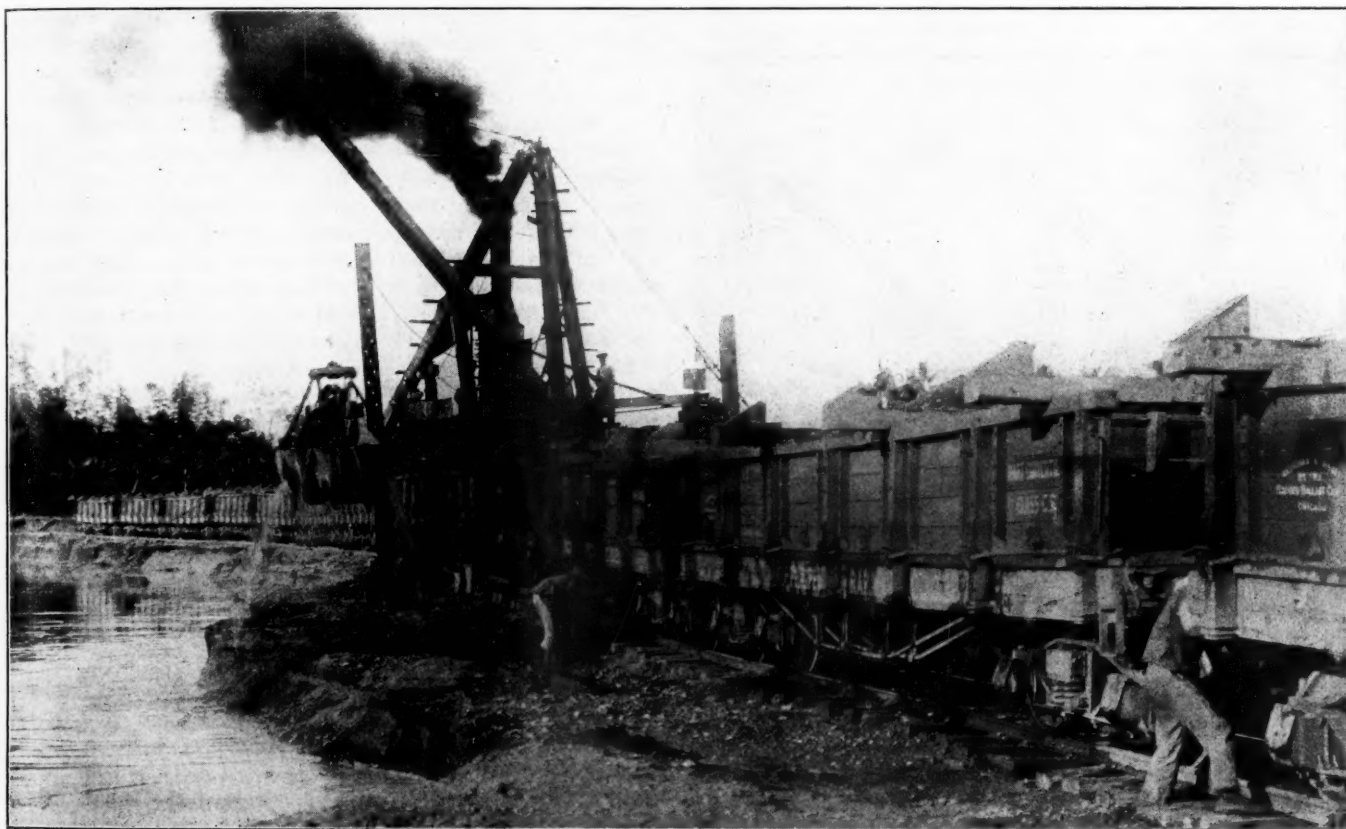
This loader was born of our necessities, a mention of some of which will show the reason for such an, at first sight, awkward machine. Track had to be ballasted pretty close up to the track laying, and the only fit ballast material was gravel. This was only to be had in the beds of streams—dry a good deal of the time, but subject to sudden floods from rains in the mountains, often at times when no rain occurred along the railway or at the pit.

On the island of Cebu delay in receiving shipments found us with only two locomotives with which to lay track, swing material and handle ballast, leaving no spotter engine for ballast pits. As ballasting had become imperative if track laying was to

weight and strain, when working, was largely carried by the needle beam and its spuds. The machine was moved back with tackle running to a drawhead one or two cars back, and operated with one of the nigger heads, arranged while loading was going on.

The other nigger head lifted the spuds. To bring these home after moving the car back, they were dropped, and the boom swung to the left or to the opposite side from the pit; then a native slipped a 1½-in. pin into the highest exposed hole under the needle beam, the boom was at once brought over and the loading begun, the native getting the pin through the other spud before the loaded bucket was back over the car. I never saw the pit spud settle enough after this one operation to require repeating it. To avoid settlement, each spud had four blocks bolted on each side at the foot, increasing the bearing area to about 4 sq. ft.

The machine was operated with a double 7-in. two-drum engine. Both a clam shell and orange peel bucket, each of 1 cu. yd.



Ballast Loader Used on Cebu Island.

continue, one engine was assigned to track laying during the day and swinging material at night; the other to hauling and distributing ballast. This left one engine at night for repairs or extra work. The ballast loader was built out of what material was available. It travels over the tops of a standing string of cars, beginning at their front end, and thus avoids the need of a spotter engine. The machine always stands on an empty car, making two moves to load the car in front of it, and of course occupies an empty car at the rear after loading all the others. This car, with a single switch, comes on the front of incoming empties when the track is pulled, so the machine is in position to proceed with the loading of them.

The first machine, the one on Cebu, has two side sills of hard wood and was pulled backward, the sills acting as runners engaging on the crosspieces seen in the photograph. The crosspieces had chuck blocks at the ends to guide the runners and a ¾-in. sunken roller at each end, over which the sills or skid pieces rolled. These crosspieces rested on the car sides, which was a little hard on the stake pockets, and in some cases they required reinforcing. The machine was not hard on the cars, as the

capacity, were used, alternated on account of repairs. The repairs, at first, were considerable, particularly during the experimental stage, due largely to poorly adapted but the only available material, and also to lack of shop facilities. It did not appear, however, that it was the cause of much additional repairs to the cars; the principal trouble with them was due to the climate causing tremendous shrinkage and rapid deterioration, requiring constant tightening up of rods and all bolts.

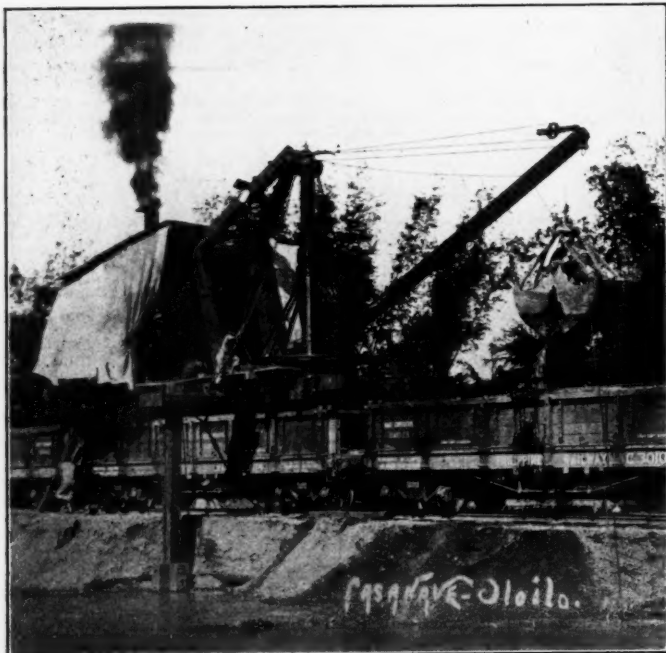
The cars held about 12 yds., and a good white foreman with an efficient engineman and about six natives would, after experience with the machine, load a string of cars in 10 minutes per car, including moving and loading. They often made very much less for single cars, but, owing to the shortage of equipment and other causes, this output was seldom attained per day. During my time the machine loaded nearly all the ballast for about 40 miles of track on the island of Cebu, and I understand that it was continued in service until the completion of the ballasting.

I built a second machine on the island of Panay, and used it to load for the track on that island. It operated in exactly the

same way, but was heavier and stronger, had an 8-in. engine, and the machine was mounted on four small wheels, traveling on 40-lb. rail laid on a light stringer on top of posts set over the side car sills. A pair of changeable filler rails was used between the cars; these were moved back to between the cars of the next set-up while loading was going on. In my time it probably loaded 50,000 or 60,000 cu. yds., but it made no better economic showing than the primitive Cebu machine. At the same time it is more like a machine, is on the right lines, and with better details and facilities to make them it would do good work under conditions similar to those that occasioned these two.

They were easily moved over the road from pit to pit by going slow and keeping the spuds close to the ground, but with pins held tight against the needle beam by the engine; and no overturns, as far as I know, ever occurred, with a 3-ft. 6-in. gage, nor should one. There is nothing particularly novel about the machine, except that we consider that operating a derrick atop of the car instead of on the ground is an upside-down proceeding.

One thing that occurred illustrates the kind of expected hap-



Machine on Panay Island.

penings that called for something like these machines. It was a clear day overhead at the pit, but with clouds hanging around the tops of the mountains seven or eight miles away and 1,500 to 2,000 ft. high, which, unknown to those at the pit, were precipitating a heavy rain at the head of the stream. In a few minutes after the show of water it was above the sills of the cars that stood on the track along the edge of the long pit, which was exhausted and excavated from 15 to 20 ft. deep its full length, at the time a track farther over was under way. The water soon went down, but it had replenished the pit to such an extent that after straightening up the track and cars, a small job, work went on and that track was not abandoned for months. In the meantime other floods had occurred, however, adding to the supply.

The Swiss alone seem to be able to keep down working expenses this year. The prospect of a deficit was so threatening last year that train service was cut down, and other measures taken to save money. Now for the first eight months of this year the gross earnings have increased 6.4 per cent., and the expenses decreased 1.3 per cent.—from 65 to 60 per cent. of the earnings. The result of this is an increase of no less than 20.7 per cent. in net earnings.

THE RAILWAY OWNER, RAILWAY EMPLOYEE AND RAILWAY USER.*

BY HOWARD ELLIOTT,
President Northern Pacific.

The railway owner, by his courage, energy and intelligence in adopting advanced methods, has been able to improve the railway system of the United States steadily in the last 40 years and still maintain and operate his property in spite of reductions in rates. If the railway user had paid, for the year which has just passed, the same average freight rates as in 1870, he would have paid \$2,691,473,751.36 more than he did pay; if he had paid the same average rates per passenger mile as in 1888, the additional payment would have been \$147,260,000, the two amounts being greater than the entire earnings of all the United States railways in the last year.

But the railway owner is now put to it to maintain and operate his property on the basis of present rates, present wages, present prices for material, present taxes, present rigid government restrictions, and the growing demand of a prosperous people for more and better service.

Railways are using rails of 90 and 100 lbs. weight to the yard; freight cars carrying 50 and 60 tons of freight; passenger cars weighing 50 and 70 tons often carrying only a dozen people, or five tons of dead weight for one passenger, and locomotives weighing 300,000 to 600,000 lbs., with 58,000 lbs. on a single axle. The railway owner can go no farther in using larger tools in his plant and must depend for any further economies upon an improvement in the work of the railway user and employee in using that plant. If the railway user fails to load and unload the cars promptly, if the railway employee is careless and inefficient, the railway cannot be used to its full effect.

The American railways to-day are represented by a capitalization of \$13,600,000,000, or a trifle less than \$58,000 per mile of road, and less than \$40,000 per mile of track. Compare this total capitalization with the total reported for farm values—\$20,514,001,838 for 1900, and in manufacturing—\$12,686,265,673 for 1905, and it will be seen that the railway is the second great industrial interest in this country. The railways in Europe are capitalized per mile as follows:

United Kingdom.....	\$275,040
France	139,390
Germany	109,788
Austria	112,879
Russia	80,985
Belgium	169,806

Here is evidence that the American railway owner has produced a piece of machinery with far less average capitalization than in any other country; which does more work in moving the commerce of the country per mile of railway than in any other country, and which has steadily reduced the prices charged to the railway user in spite of increasing costs and complications in doing the business. The American railway system of to-day could not be reproduced for a figure anywhere near what it stands for on the books. Monthly, daily, almost hourly, improvements have been made, and the railways are becoming seasoned and better adapted to the great work they have to perform. Go to any of the large cities and growing towns and try to acquire sufficient terminal ground to do even a moderate business. Not long ago in New York, an investigation was made with the idea of seeing what it would cost to get an entrance to the city and a moderate terminal area, from the northern boundary down to about Fortieth street. One of the best real estate agents in New York made a calculation, and a right of way down through Manhattan Island sufficient for two tracks and with a limited terminal at the end, he thought might be obtained for \$170,000,000, but would probably cost \$200,000,000. This would be an investment of \$170,000 or \$200,000 a mile for the New York terminal alone of a railway between Chicago and New York, and in addition right of way between the two cities, intermediate terminals, and the railway itself must be obtained. And every man of his own knowledge is aware of the fact that property suitable for terminals, in common with

*Extracts from a recent address at the Montana State Fair, Helena, Mont.

other real estate, has advanced very much in value in all cities, big and little, in the United States in the last 25 years, and that the railway owner is paying taxes on those increased values and is surely as much entitled to a return on the increased value as is the owner of a farm, or the owner of a business block.

There are 1,525,000 railway employees, including the officers, representing at least 6,000,000 of the population of this country. They are equal, in honesty, intelligence, industry and character to the average of American citizens engaged in other pursuits. They are trying to do their part in managing and operating this great piece of commercial machinery that the railway owner has created. As they are human, they make mistakes, and sometimes forget that they assume an obligation when they enter the railway service, to be honest, fair and loyal to the railway owner and to the railway user. The great army of railway employees in their efforts to obtain the highest wages possible must remember that there are only 100 cents in a dollar; that it is possible to force wages to a point beyond the ability of the railway owner to pay and still maintain his plant for the benefit of the railway user, and that the constant wage increase has already discouraged the railway owner, and will tend to discourage him more unless additional revenue can be obtained from the railway user. The railway user often fails to understand the wage situation, and the railway employee and the railway user must remember that in fixing wages they must consider the ability of the business to pay the wages demanded.

In 1908 the official figures show that there were 1,458,244 railway employees receiving \$1,051,632,225 in wages, or an average of \$721.16 per year. For the year 1907 the average pay of railway employees in the United Kingdom was \$260; in Germany, \$371; in Switzerland, \$292; in Belgium, where the railways are owned by the state, firemen received \$15 to \$23 a month, the higher rate only after 15 years' service; enginemen from \$2.50 a month to \$28 a month after 24 years' service; conductors from \$15.97 a month to \$34.70. The average railway worker in Belgium gets 43 cents a day. Certain classes of American railway employees get more in a month than Belgium railway employees average in a year.

The advances made in wages in 1906 and 1907 increased the payrolls of the railways about \$120,000,000, and increases since then and now under discussion mean \$60,000,000 to \$75,000,000 additional. These two increases are equal to 7 per cent. per year on a capitalization of from \$2,500,000,000 to \$2,750,000,000, a sum of money that would go a long way in adding to the transportation facilities of the country.

The railway employee has a responsibility to the railway user to be sober, industrious and careful, so as to furnish the best and safest transportation to the public, and he has a responsibility to the railway owner to furnish a full day's honest and efficient work for the compensation that he receives, whatever it may be. The industrial supremacy of America cannot be maintained unless that is done, and every patriotic man, no matter what his employment, should stop waste in labor as well as in material, and expect hard work and rigid economy.

Suppose each one of the railway employees should, by better work and greater care, save only 1 cent a day; that would mean for the country \$5,566,250 a year, or enough to buy between 5,000 and 6,000 freight cars; or, enough to build 200 miles of branch line railway in Montana. If they could save 10 cents a day, it would mean \$55,662,550 a year, which could be applied to adding to the railway facilities in the country.

In addition to the 1,525,000 employees working directly for the railways, there are 2,500,000 in coal mines, steel mills, manufacturing plants, all supplying what is necessary for the railways in their operations, who represent at least 10,000,000 of our total population. So the railway employees, and the employees of the industries dependent more or less on its maintenance on a sound basis represent approximately 16,000,000 people whose rights must be considered.

The railways are the great purchasers of materials of many

kinds, and the moment they are forced to stop buying the effect begins to be felt in the forest, the mine, the mill and the factory.

Of the 90,000,000 people in the United States, there are about 4,000,000 interested directly as railway owners, and their dependent families; 6,000,000 as railway employees, and their dependent families, leaving 80,000,000 as railway users, with an indirect interest in the prosperity of the railway. Some of these 80,000,000 are vitally interested, because they work for industries dependent upon the purchasing power of the railway for their success; others because they have their savings in banks and trust companies; others because they hold life insurance policies for the protection of their families, and fire insurance policies for the protection of their homes and business, and all are interested in having enough transportation and good and safe transportation.

The railway user, however, is too apt to think that his interest lies in having railway rates constantly reduced, railway wages constantly raised, and railway taxes constantly increased, forgetting that it is equally important to him, and really more important, to have the railway system of the United States so handled that capital will feel safe in adding to investments necessary to furnish the transportation that the business of the country demands. Already, in certain parts of the country, the margin between adequate and inadequate transportation is too small. Only last winter, between the Missouri river and Chicago, and in the vicinity of Chicago, the railways could not furnish that prompt and regular service that is essential for a satisfactory movement of the commerce of the country.

The railway user needs safe and adequate transportation, and it will be furnished just so long as the business pays. The railway owner cannot constantly be borrowing money for every minor improvement and addition to the property. The cry is sometimes raised that the railways should not make improvements out of current earnings. They should not make all of their improvements out of current earnings, but they should put back into the property every year a substantial amount of their earnings for improvements like better passenger stations, more side tracks, better rails, better ballast, safety appliances, and other forms of improvement of which the present generation of railway users get the immediate benefit, as well as enabling a higher development of the country for their children and grandchildren.

The railway owner, the railway employee, and the railway user must co-operate, and all must remember the definition: "The association of a number of persons for their common benefit." In the long run it will not benefit the railway user to crowd down rates so low, and raise taxes so high that he takes away all chance of profit from the railway owner. The railway employee must remember that in the long run he will not profit if he crowds up wages so high that the railway owner has not sufficient margin for the development of the facilities along progressive and safe lines. On the other hand, the railway owner must, in fixing the rates, do so in such a way that a healthy development of the country will be promoted.

Individually, the railway owner, the railway employee, and the railway user, when they discuss the subject, are fair, and agree there should be fair treatment to all.

There is, however, a school of politicians who make wild and extravagant statements and who are assuming, without knowing the facts, and without adequate study of the situation, that great injustices are being done. It is important for the railway employee and for the railway user to post themselves about this general subject if they are to continue to exercise their present control in the management of the business of the railway owner. His business is now an open book, and every transaction is recorded in plain black and white and reported at frequent intervals to railway commissions, state or national. The charges that he makes for service performed are largely decided by statute or by railway commissions. Many of the rules under which he conducts his business are made by law, or by various boards. The railway user, if he wants the best railways and

progressive development of them, must see to it that his law-makers and his boards of one kind and another are the right kind of men, and that they look at this question, not in a narrow, partisan way, but in a broad, far-sighted manner.

The future welfare of the railway system of the United States is largely in the hands of the railway user, and what will he do? Will he crowd the railway owner so hard that the latter cannot produce the increasing amount of transportation needed for the free flow of the commercial life blood of the nation? Then what? The railway user will have several courses open to him. He can have a less rigid system of regulation and government red tape and encourage the railway business and the railway owner to go on as does other business, subject to the great laws of supply and demand, competition and the natural desire of the owner to manage his business in such a way that it will be a success, with the hope of profit, which is the main incentive of all business. Or, he can take over the ownership and management of the railways and become responsible for their operation and for the money needed for additions and betterments to existing properties, and for the building of new ones. In the present state of politics in this country such a plan is almost terrifying in its possibilities, because the government has not shown that it can do work of this character as efficiently and economically as private individuals can. Government ownership, management and development of the railways would become a matter for the politicians to trade upon. Just recently, in Austria, there has been considerable discussion because the railways were taken over by the state on the theory that better service and lower rates would be given to the public. Now, there is agitation to put them back into private hands, for, instead of proving profitable, there is a heavy annual deficit, which the general taxpayer has to make up. The service has deteriorated and railway expansion has ceased.

Or he can continue the present system of rigid governmental control and supervision, and interference with the judgment and management of the owner, which is rapidly having a deadening and discouraging effect on the development of the business, and is preventing those additions and improvements so much needed in a growing country like the United States. Or, he can continue the present system of government regulation and control, but guarantee to the railway owner some minimum return upon his investment, so he will be willing to put money into the business. Such a plan, however, means that the nonuser of the railway will be taxed for the benefit of the user.

To my mind the first course, of more commercial freedom, is by far the better for a growing and expanding country like the United States. We have not yet reached the state of perfection, politically or socially, where government ownership and bureaucratic management of the large, complicated and delicately adjusted railway system of the country will be a success. Putting a government uniform on a railway employe does not at once endow him with a new kind of intelligence and supernatural powers, and it will reduce his feeling of responsibility.

If the railway user and the railway employe are not careful to see that justice is done to the railway owner, and if he is not protected and encouraged a little, the time is rapidly coming when the railway user will go to buy some transportation for his wheat, his coal, his cattle, his manufactured articles, and he will be confronted with the statement from the railway owner that all the transportation he has has been sold, and furthermore, that he cannot produce any more transportation because he cannot get any more money, and if the railway user desires an increased quantity or quality of transportation he must organize and produce it for himself. The railway employe will find that the monthly pay day is not so regular and certain as it used to be, and that the wages paid are lower than they now are.

The ultimate good sense of the American people and their belief in the rights of property will, in the long run, I believe, prevail over the misstatements and misrepresentations of some public men, who, without careful study and full knowledge of the situation, and without due regard to the effect of their ex-

travagant language, make indiscriminate attacks upon the railway system of the United States, and upon the men who are giving the best that is in them to the work of advancing that system.

This wonderful American railway system has been created by the railway owner and capitalized at from one-half to one-fifth of the European railways. It does twice as much work at rates from one-half to one-third of, and pays wages from two to five times as much as are paid by European railways. The size of the United States and the wide distribution of the products are such that it is necessary to have a large use of the railways and low rates. To accomplish this, there must be an expansion of facilities; the railway owner has done his part; further expansion can only be brought about through the help of the railway employee and the railway user.

The railway owner, the railway employee, and the railway user form an "association of persons who should act for their common benefit;" not for the benefit of one and the injury of the other, but for the common benefit of all. There has just been a meeting in St. Paul where there was much discussion about the Conservation of Natural Resources. It is high time for the railway user to consider carefully the conservation of the railway system of the United States. Common sense, publicity, plain statements of the facts, and justice to all interests, whether individual or corporate, will help to settle this question properly.

EARLY DAYS OF THE RAILWAY SIGNAL ASSOCIATION.*

BY GEORGE M. BASFORD.

This is a very pleasant occasion; but the signal engineer was formerly a serious man. He seldom smiled. How could he? He had little to smile about. He had plenty of responsibility and very little else. To-day he has much to encourage him and make him happy.

Five heroes and a secretary met in Chicago March 11, 1895, to prepare for this very successful movement. These young men, pioneering in signaling on western railways, working under difficulties, realized the greatness of the signaling problem and saw the need of recognition of the possibilities of signals and signal engineers. In the railroad organizations we reported to all kinds of officials. Some reported to chief engineers, others to superintendents of bridges, others to operating officials. The speaker had under his charge fifteen interlocking plants and all the signals on a 6,000-mile railway [Chicago, Milwaukee & St. Paul]. At the beginning he had two lonesome assistants for their maintenance and for miscellaneous construction work. But for the valuable and efficient assistance of the signal companies our burdens would have been much greater than they were. Few of us had up-to-date apparatus. Most of us had a generous sprinkling of old "wheel machines" which required regular attendance of trained nurses, but we did not even receive the compensation now gratefully accorded to that profession. We had, in some cases, three kinds of signaling at a single plant. We picked ice out of switches. We broke our necks climbing poles. We assisted at wrecks which persisted in occurring at interlocking plants. We sat up all night, in the cold, with sick automatics. We were "called" at 2 a. m. to handle a tower, telegraph train orders and all, because the night man was drunk and no one else knew the combinations. * * *

Railway signaling has now reached a point which makes it a vital and fundamental part of railway construction and operation. Signaling is not now considered as a safety measure alone. Railway managements now consider it as a means for increasing intensity of traffic as well as providing safety. The two are necessarily combined. * * * There lies before the signal engineer the problem of co-operation with all other engineers and operating officials to produce the maximum intensity

*From an address at the annual dinner of the Railway Signal Association, Richmond, Va., Oct. 12. Mr. Basford, now with the American Locomotive Company, was the organizer and first secretary of the Railway Signaling Club, which has grown into the present national association.

of traffic and the maximum of safety. No problem is more interesting than this and none that faces any railroad official is more inspiring. If one has a serious desire to leave the world better than he finds it he has in signaling an opportunity for the development of his ideal and ambition.

Signal problems have changed radically with the advent of the subway, the tunnel and the busy terminal. Without signals the most recent and most intensely active transportation developments would be impossible. * * * The speed-control system recently installed in the New York subway increases by 21 per cent. the capacity of tracks already extremely busy. This and other similar developments explain how one railway system operating entirely within the limits of one city is safely handling 2,000,000 passengers a day, with the traffic doubling every ten years.

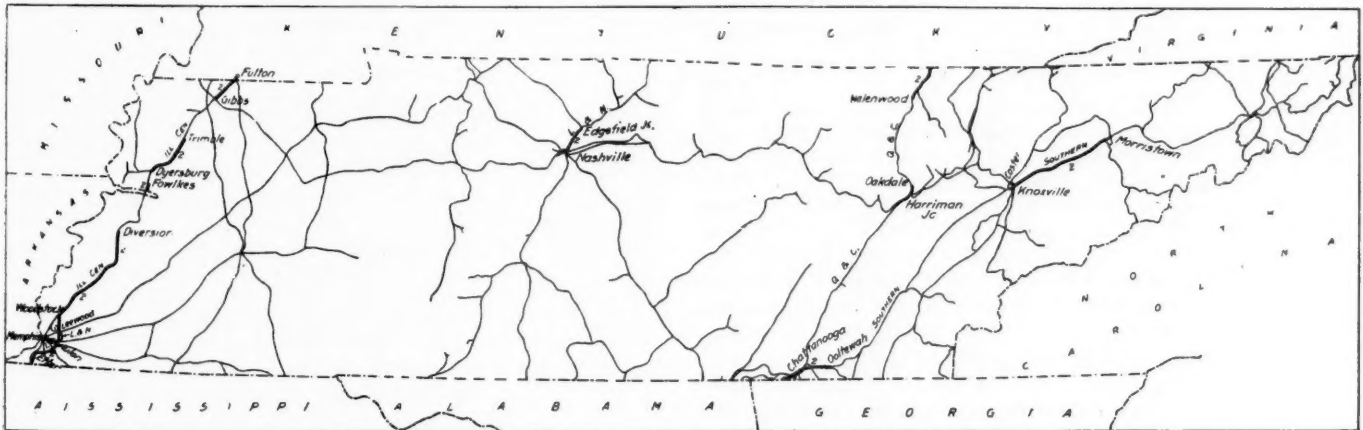
That the railways would some time be held accountable for systematic and uniform principles in signaling was anticipated fifteen years ago; and, like many other features of railway practice, signaling will sooner or later be the subject of governmental efforts to direct and systematize and control. It will be fortunate if through the work of this association the signaling of American railways may be so systematized and so highly developed upon sensible, correct lines as to lead finally to the adoption of the principles laid down by the association, as those which must be followed. The fact may be accepted as established that if the Railway Signal Association, with its membership of over 1,200, first stands for the best in systematized signaling and then increases its influence to the extent of the general adoption of its methods, not only will the day of outside control be deferred, but that control will, when it comes, be acceptable and perhaps even desirable.

It will be wise to see what must be done sooner or later and win honor by doing it in advance of requirement and compulsion. That this association has this great work to do and that a great opportunity lies before it to do it well, is the thought I would like to leave with you.

DOUBLE TRACK RAILWAYS IN TENNESSEE.

The railway map of Tennessee, given herewith, is printed for the purpose of showing all sections of railways in the state on which there is more than one track. The termini of the sections, as shown in the map, are as follows:

TENNESSEE.		No.	Approx.
		tracks.	miles.
<i>Illinois Central.</i>			
Fulton, Ky., to Gibbs.	.....	2	10
Trimble to Dyersburg.	.....	2	18
Fowlkes to South Fork.	.....	2	3
Dyersburg to Woodstock.	.....	2	41
Memphis Terminals.	.....	2	5
Woodstock to Etter.	.....	2	20
<i>Nashville, Chattanooga & St. Louis.</i>			
At Chattanooga.	.....	2	5
Nashville to Shop Junction.	.....	2	5
Aulton to Memphis, Tenn.	.....	2	2



Double Track Railways in Tennessee.

	No.	Approx.
	tracks.	miles.
<i>Queen & Crescent.</i>		
Flat Rock, Ky., to Helenwood.	2	30
Oakdale to Harriman Junction.	2	4
<i>Louisville & Nashville.</i>		
Edgefield Junction to South Nashville.	2	11
Aulton to Leewood.	2	4
<i>Southern.</i>		
Knoxville to Morristown.	2	42
Knoxville to Coster.	2	2
Chattanooga to Ooltewah.	2	15
At Memphis.	2	4
<i>Yazoo & Mississippi Valley.</i>		
Etter to Lakeview, Miss.	2	7

DOUBLE TRACK LINES IN KENTUCKY.

The statement of double track in the state of Kentucky published in the *Railway Age Gazette* of September 16, page 498, shows a line 34 miles long as a part of the Chesapeake & Ohio which should be entered under the head of Louisville & Nashville. It is correctly shown in the map.

FOREIGN RAILWAY NOTES.

The French have had a railway in operation since 1904 in Senegal from Kayes, the head of navigation on the Senegal river, east by south 345 miles to Kulikoro, on the upper Niger, whence it is navigable to the great native African city Timbuctoo. On this line there are two trains each way daily, an "express" (if so it may be called), which makes the trip in four days, stopping nights, and a mixed train, which is five days on the way. In either the passenger has leisure to see the country, the average speed being six and seven miles an hour. A considerable traffic was hoped from the boats on the Niger, but in the first year this connection was made the whole tonnage carried was 26,125 tons, or less than 90 tons daily, and in the two following years this tonnage decreased. The gross earnings, which were \$507,800 in 1905, fell to \$465,600 in 1909, when the net earnings were \$209,900, or \$606 per mile.

In view of recent serious accidents, in France, it has been charged that the passenger cars are too light. The management of the State Railways replies that there are three kinds of passenger cars. Those marked with two stars are the modern ones, and may be run at the greatest practicable speeds; those marked with one star may not go more than 62 miles an hour, and those without any mark are limited to 56 miles an hour. All kinds of cars may be made up into one train; but in that case written notice must be given to the engineman not to run more than 56 miles an hour. There was one unmarked car in the train recently wrecked, and the engineman had been notified. Whether he ran more than 56 miles an hour cannot be proved; for the engineman was killed, and the speed recording apparatus was demolished.

General News Section.

The Cincinnati, Hamilton & Dayton now uses the Union station for all passenger trains in Toledo.

Passenger trains began running regularly through the Michigan Central tunnel under the Detroit river October 16.

At Los Angeles, October 1, the Atchison, Topeka & Santa Fe was fined \$100 for violating the federal hours-of-labor law.

The Northeastern Pennsylvania Car Demurrage Bureau, A. G. Thomason, manager, with headquarters at Scranton, Pa., is to be abolished at the end of this month.

Near Genoa, Wis., on Thursday of last week, the engineman of an express train of the Chicago, Burlington & Quincy was shot in the head by a stray bullet from the rifle of a hunter.

In the Federal Court at Jefferson City, Mo., last Tuesday the Missouri Pacific was fined from \$10 to \$25 each on 24 counts for violating the sixteen-hour law. The evidence indicated that employees were worked overtime from ten minutes to one hour.

Machinists of the Baltimore & Ohio, who have been on a strike for about a year, are to be reinstated, an agreement having been reached between Mr. Harris, superintendent of motive power, and Mr. Mulholland, attorney for the National Organization for Machinists.

The shops of the Seaboard Air Line at Portsmouth, Va., are now running nine and a half hours daily (with a Saturday half holiday), following a long period of short hours. We understand that the same change has been ordered at the other principal shops of the company.

The turbine steamships, Yale and Harvard, heretofore running between New York and Boston direct, in the service of the Metropolitan Line, have been sent from New York around Cape Horn to San Francisco, and it is said that they are to be used by the Western Pacific in coastwise service, probably between San Francisco and Los Angeles.

The directors of the Grand Trunk Pacific have issued a statement as to the progress being made in the construction of the line, which says that satisfactory progress is being made on the Winnipeg, Lake Superior and prairie sections, but that a great scarcity of labor exists in the mountain sections, where contractors are short 5,500 men of the number required, despite wage offers of \$3 per day.

On November 26 the New York State Civil Service Commission will hold examinations for the following positions: Assistant chief, Division of Statistics and Accounts, Public Service Commission, Second district, \$2,400; junior statistician, \$1,200 to \$1,500; mechanical engineer, Transportation Department, Public Service Commission, First district, \$2,401 to \$3,000. Application blanks must be filed on or before November 19.

The Canadian Railway Accident Insurance Company of Ottawa, Ont., has been absorbed by the Liverpool & London & Globe, the price paid for the shares (par \$25) being \$100 per share. The Canadian Company was established in 1895, with an authorized capital of \$500,000, of which \$250,000 was subscribed and \$62,500 paid in in cash. The company issues accident policies for railway employees and last year had a premium income of \$333,336, with losses of \$149,462.

The strike of railway employees in France was called off on Monday night last and the men reported for work the next day, but considerable disorder continued and the government maintained a strong force of troops in Paris. Bombs were found at 12 different railway stations in that city. On Monday a bomb was thrown at the entrance of the tunnel near the Chantiers station at the moment a passenger train was due from Dreux, and all Versailles was shaken. Attempts at train wrecking were reported from various parts of France, and serious catastrophes were narrowly averted.

On Sunday last, October 16, Mr. Clement, of the firm of Clement & Bayard, with six other persons, including his assistants and a member of the British Parliament, representing a committee of that body, flew from Paris to London in a dirigible balloon, making the passage of 195 miles in six hours. He

started at 7:15 a.m. and reached London at 1:15 p.m. The distance and the starting point are not clearly stated in the despatches, and it is stated that the railway trains and connecting boats across the channel traverse a route of about 246 miles, so the figure above given appears to be the air line distance actually traveled. It is said that the war department of Great Britain will make experiments with this balloon. No stop was made in the flight. The altitude maintained was from 300 to 700 ft.

Safety Appliance Order.

The Interstate Commerce Commission has concluded its consideration of the freight-car questions which were the subject of its hearing on the 29th of September and on October 15 issued an order, as required by the terms of a law passed by Congress at its last session, establishing uniform standards for the equipment of freight cars with certain appliances. The order has not yet been published but a statement issued by the commission says:

"The order does not make any radical change in equipment. Its main purpose and intent is to require that all classes of freight cars shall be equipped alike in all parts of the country, as such uniformity is regarded as highly conducive to the safety of employees. All the appliances covered by the commission's order are now used on cars, with the exception that two additional ladders are required on certain classes of cars, and two additional sill steps are required on all cars.

"In the past the appliances placed upon cars for the safety of the men have been covered by rules made by the Master Car Builders' Association. These rules have not been binding upon the railways, and have not been lived up to, the consequence being that each road has followed its own ideas, and it has been impossible to secure the desired uniformity.

"It is not expected that compliance with the order will cause any undue expense to the roads, as the order applies entirely to new equipment and is immediately effective only with respect to new cars. The change in equipment of cars now in service so as to bring them up to the requirements of the commission's order will be made gradually, as the cars go through the shops for general repairs. This part of the subject will be dealt with by the commission in a future order, a sufficient extension of time being granted to bring old equipment up to the uniform standards without undue expense."

The Public's Investment in Railways.

By dealing a blow at the railways a great part of the population is dealing a blow at its own interests. Take first the case of the depositors in savings banks. Three years ago a statement was prepared which showed that in the six states chiefly distinguished for their savings deposits, the aggregate of railway securities of steam roads owned by the savings institutions was no less than \$442,354,086. The aggregate deposits in the six states then amounted to \$2,177,859,256, so that over 20 per cent. of the entire total was invested in railway securities. There were 5,174,718 depositors in these six states at the time. In other words, over five million persons were interested as depositors in the savings institutions in these states, and these institutions had one-fifth their entire funds out in investments in railway bonds. The savings banks in thirty other states, according to incomplete private returns, at that time showed \$128,677,191 more of railway securities owned, this constituting over 26 per cent. of the deposits as represented by over a million depositors.

The life insurance companies at that time had \$668,262,896 invested in railway bonds and stocks, this forming over 31 per cent. of their aggregate assets of \$2,128,131,253.

The task of bringing these figures down to date would be a very laborious one and a great deal of time would be required to do it. We shall content ourselves, therefore, simply by indicating that the aggregate amount invested in this way is to-day very much larger than it was at the time of the compilation from which we have been drawing was prepared. We have gone to the pains to look up the statistics for the savings banks

in the six states already referred to, and find that the aggregate of the six states now stands at \$614,648,723, as against \$442,354,086. The details for the different states appear in the following table. It will be observed that in Maine over 50 per cent. of the deposits are invested in railway securities; in Connecticut, 41 per cent.; in New Hampshire, 38 per cent., and in New York, New Jersey and Massachusetts, 16.87 per cent. to 23.30 per cent. It should also be noted that the number of depositors in these six states now exceeds six millions.

State.	No. of depositors.	Deposits of savings banks.	Railway (steam) securities owned.	Pr. ct. of deposits.
New York.....	2,831,380	\$1,483,449,494	\$250,546,600	16.87
New Jersey.....	294,106	99,939,691	23,292,375	23.30
Massachusetts ..	2,040,894	743,101,482	155,429,540	20.91
New Hampshire..	192,540	85,103,962	32,398,912	38.06
Connecticut	553,247	263,332,562	108,102,686	41.05
Maine	228,205	88,557,027	45,078,610	50.90
Total	6,140,372	\$2,763,484,218	\$614,648,723	22.24

It may be taken for granted that the investments of other classes of institutions at this date would be correspondingly larger than three years ago. Roughly speaking, it is probably correct to say that the aggregate investments of savings institutions, insurance companies and educational institutions at this date must stand in the neighborhood of \$1,750,000,000. Just think of placing such an enormous investment in jeopardy by adopting a policy which would deny to the railways the right to advance the price of the services rendered by them as the cost to them of doing the work increases. Is not the policy a short-sighted one, and will it not react to the detriment of those who are endeavoring to gain political capital for themselves by arousing the passions of those who do not stop to think that they themselves have so much at stake in seeing that fair treatment be accorded the carriers?

—*Commercial and Financial Chronicle.*

Wellman's Airship.

The long heralded attempt to sail across the Atlantic ocean in a balloon was finally begun on Saturday morning, October 15. Walter Wellman, with five companions, started from Atlantic City, N. J., about 8 o'clock in the morning in the dirigible balloon "America," and on Sunday about noon he passed Nantucket; but during the next 24 hours nothing was heard of the airship, although many steamships equipped with wireless telegraph apparatus were on the watch for messages. On Tuesday morning about 5 o'clock the airship was cited by the British steamship "Trent," about 450 miles east of Cape Hatteras, whence it had been blown by adverse winds, about 350 miles (south) out of its intended course. The aeronauts were rescued by the "Trent" and the "America" was abandoned. When the life boat, suspended beneath, was detached, the balloon at once rose rapidly, and it is expected that when heated by the sun it will burst and sink. The "America" was in the air about 71 hours and traveled approximately 850 miles. Count Zeppelin with his airship, much larger than the "America," remained aloft 37 hours at one time.

On Sunday the "America" had to descend to nearly the surface of the water to get out of an electrical storm, and then in order to rise again it was necessary to throw overboard several barrels of gasoline. On Monday the heat of the sun caused the gas to expand and the balloon to rise, and there was great difficulty in getting down again. Later it was necessary to throw overboard about all of the fuel.

Just Plain Common Sense in Utah.

The Utah Press Association has passed resolutions to the effect that a state railway commission is undesirable. It says: What Utah needs is further railway development in order that she herself may expand and develop, and this association desires to endorse the policy of the present railway management and to encourage rather than to retard railway building. What we want is more railways in Utah. We are opposed to the creation of a railway commission for this state, regarding it not only as wholly unnecessary from a business point of view but also dangerous because of the probability that it will become a political machine capable of great and unreasonable oppression in the hands of designing or unscrupulous politicians. With the great number of commissions which the state already has, such creation not only is uncalled for but possibly is oppressive.

Car Efficiency.*

As long ago as July our bulletins showed that we had a much smaller car surplus than we had last year and two years ago, and that this surplus was diminishing rapidly. We, therefore, urged the railways to call the attention of their shippers to the fact that we still had a surplus and that it would be well to utilize it by making all possible advance shipments. Up to the first of September it looked as if a serious car shortage were coming, the surplus rapidly diminished and we noted quite a sizeable little shortage, over twice the shortage of a year ago, but when we came to our next bulletin, for the middle of September, the shortage had not increased. It had dropped to the unimportant figure of a year ago. The only sign of the importance of the freight car was my receiving two invitations to dinner from two traffic clubs. Something had happened, but what that was it was very difficult to find out. I was afraid there was something in the political situation, that something had possibly been said by gentlemen who were asked out to dinner, more than I am, but when I put the figures up to the Committee on Relations Between Railroads of the American Railway Association, a committee composed of transportation men from all over the country, they did not feel that traffic was falling off, even if there were not much of a car shortage. They felt that we were handling more business than ever before, but that we were handling it better, and that the shippers and consignees were handling it better. They felt that the railways were making so much better time in handling the cars and that the industries were making so much better time in handling the cars, that we were then doing a big business without a big shortage, but they thought that quite a shortage might be coming. Our last bulletin, which is just out, tends to confirm their impression. The surplus is still dropping, as it did last year, and the shortages are twice what they were last year. The resumption of mining in the Middle West is the chief factor in this. It seems to be the first period in three years that the railways have run full, and I am convinced that they are making a record.

There have been two changes in conditions, as compared with last year. First, the railways have increased their rate of payment for cars 40 per cent. A year ago they were paying each other 25 cents a day for the use of freight cars; this figure has been raised to 35 cents. This is not as high as the 50 cent figure which was in effect three years ago, and which was broken down by the panic. Some of us feel that the old 50 cent figure was not as much of a success as it might have been in stimulating the movement of freight cars, but it did stimulate the building of freight cars at the time when they were most needed. The 50 cent rate did not operate to quicken the movement of cars when they absolutely could not be moved faster, but I believe that when the round up is made and the figures are ascertained we shall find that the 35 cent rate does stimulate the movement of cars now that there are sufficient facilities to allow a quicker movement.

The national car demurrage rules have been put in general effect throughout the country. There has been a fight against them in Michigan which the railways have won in the Michigan state courts, and there is still a fight on them in New England, but in the great body of the country the national rules are in effect.

Some parts of this code are not popular in Pittsburgh, but I understand that you gentlemen have accepted them with your usual loyalty, and that you have made the best of them and found out that they were not quite so bad as they look. I trust that you realize the important thing in these rules, and that is that they are uniform. You can feel that when you handle a car promptly, it is not going to be delayed through the local regulations of any state, and the people in the extreme West and South know that if they handle a car promptly it is not going to be delayed here in the North.

This introduction of uniform rules has resulted in a great saving in cars. There is no doubt that the cars are making more miles every day this year than they did last, and we must acknowledge the cordial co-operation of the public in the handling of cars.

As to the future, there are special difficulties now before the

*From an address by Arthur Hale before the Traffic Clubs of Pittsburgh and Chicago.

railways in the way of improving their facilities, but I assure you that they are doing everything they can.

There is another step in advance which the railways ought to take, and in which, I think, the industries can help. We ought to use cars more than we do in common. There is a theory, often put into practice, that the markings on a car have something to do with the point to which it should be loaded, and it is very easy for railway officers to sit in their offices in times of car shortage and say, "we want our own cars back," but, in practice, when a car takes a load of raw material into an industry, it is not uncommon for the industry to load it out with finished product in some other direction. When the railways attempt to regulate this, when the roads try to tell industries that cars of Eastern roads must always be loaded East, and cars of Western roads must always be loaded West, they are undertaking to do many difficult things on their own account, and they are enforcing still more difficult things upon their patrons. In practice the theory does not work out. In all cases of stress the theory gives way to the practice, and we do use our cars in common, but this rough and ready method of using cars in common leads to grave injustices. The originating road which is generally the car owner, suffers as it ought not to suffer. There is only one way out of this, and that is to provide suitable regulation. I believe that a regulation can be devised under which the shipper will be able to load the cars we give to him as he pleases. When that proper regulation is provided we will make even better movement with our cars, and we will again postpone car shortage.

There is another way in which the industries can help. You can unload cars even quicker than you are doing it now. In periods of car shortage every time an industry gives us back a car well inside of the free time, we ought to make proper payment to the industry. I think that a rule can be devised by which the industries and the railways can directly share the benefit of quick work at loading and unloading points.

I hope we shall not have a serious car shortage this fall, but some time we shall have a serious car shortage, and when it comes I hope you will remember that it will take combined action to keep the industries of this country on an increase.

There are a great many ways in which what we call a car shortage may arise. There may be a real shortage in cars, but it may be only a symptom of a shortage in something else; perhaps in tracks or in repair shops, or perhaps a shortage of men, and perhaps of brains. If the car shortage prove only to be a symptom, and the real shortage be a shortage of brains or men, I trust you will sympathize with the railways and remember that they have not a monopoly in shortages of men, nor in shortages of brains.

Testimony in Illinois Central Car Repair Fraud Case.

H. C. Dolph, formerly vice-president of the Ostermann Manufacturing Company, testified at Chicago last week in the criminal proceedings in the municipal court against certain former officers of the Illinois Central for alleged frauds against the road in the repair of cars. Mr. Dolph produced a "red book" in which were recorded payments made by check by the Ostermann Manufacturing Company to officers of the Illinois Central. The special bank account against which these checks were drawn was maintained in accordance with a resolution of the board of directors of the Ostermann Manufacturing Company from February, 1908, to October, 1909. The book tended to corroborate testimony previously given by H. C. Ostermann regarding payments to the Illinois Central officers. T. J. Kirby, president of the Kirby Equipment Company, testified that certain stock of the Ostermann Manufacturing Company, which was owned by Rawn, had been carried in his name at the request of J. E. Buker.

Evidence regarding the bank accounts of Ira G. Rawn, F. B. Harriman, Charles L. Ewing, J. M. Taylor, J. E. Buker, William Renshaw and F. H. Niles was introduced to corroborate testimony previously given regarding large sums of money that these men had received as a result of their alleged participation in the car repair frauds. The evidence showed that Ira G. Rawn, whose salary as vice-president of the Illinois Central was \$20,000 a year, deposited \$79,950 in the Western Trust & Savings Bank between January 1, 1909, and May 28, 1910; \$13,529 in the Railway Exchange bank between May, 1908, and February, 1910, and \$11,333 in the Corn Exchange National bank between 1908 and 1910. F. B. Harriman, on \$10,000 a year,

deposited \$113,675 in the Railway Exchange bank between May, 1908, and September, 1910; \$146,219 in the Corn Exchange National bank between December, 1905, and April, 1910, and \$36,000 in the Western Trust & Savings bank between March, 1909, and April, 1910. Deposits in the Railway Exchange bank ceased in April of this year, shortly after his resignation from the Illinois Central, and the other two accounts were closed out on April 7. He also had a deposit at the Continental National bank, the details of which were not introduced. C. L. Ewing, on \$5,000 a year, deposited \$235,765 between February, 1907, and June, 1910, in the Fort Dearborn National bank, and had a balance on July 18 of \$258.54. The deposit of William Renshaw, former superintendent of machinery of the Illinois Central, in the Illinois Trust & Savings bank, grew from \$98,692 in March, 1908, to \$558,605 on January 10, 1910. Others of the persons implicated by the testimony also enjoyed rapid increases in their bank accounts.

Fashion Note.

"Subscriber" sends the following: "A motorman on a western road running a McKee motor car in turning in his delay report mentioned a delay of three minutes at Station A—loading a young lady dressed in a hobble skirt. This is a new condition with which the transportation companies have to cope. No doubt if the style becomes prevalent some ingenious mind will devise an apparatus for picking up such packages similar to that used for picking up mail sacks from a crane."

Which reminds us, through some vague suggestion the psychology of which eludes us, of a more truly pathetic case: A lady leaned over the seat in front of her and timidly addressed a fellow passenger: "Excuse me, sir, but would you mind getting off with me at the next station? You see," she explained, "I am rather stout, and it is easier to go down the car steps backwards. But when I do that the conductor thinks I am trying to get on and he insists on helping me back into the car. That's happened at the last three stations," she concluded, plaintively.

American Railway Bridge & Building Association.

The twentieth annual convention was opened on Tuesday morning of this week at the Hotel Albany, Denver, Colo., with J. S. Lemond, engineer of maintenance of way, Southern, presiding. The secretary's report showed 50 new members, making a total of 460. The treasurer's report showed a balance of \$342.92. There was an attendance of 100 members and 100 guests.

The entertainments consisted of an automobile trip and theater party for the ladies on Tuesday, the excursion over the Georgetown Loop to Silver Plume, Col., on Wednesday, and a trolley ride into the foothills and a banquet on Thursday. On Friday there will be a trip to Manitou, Colo.

The following officers were elected for the coming year: H. Rettinghouse, Chicago & Northwestern, president; F. E. Schall, Lehigh Valley, first vice-president; A. E. Killam, Inter-Colonial, second vice-president; J. N. Penwell, Lake Erie & Western, third vice-president; L. D. Hadwen, Chicago, Milwaukee & St. Paul, fourth vice-president; C. A. Lichty, Chicago & Northwestern, secretary, and J. P. Canty, Boston & Maine, treasurer.

The supply association was represented by 28 firms. The officers for this association for the ensuing year are: W. H. Lawrence, Standard Asphalt & Rubber Company, president; L. E. Walcott, U. S. Wind Engine & Pump Company, vice-president; H. Henning, Eastern Granite Roofing Company, treasurer, and J. A. Meaden, Paul Dickinson Company, Inc., secretary.

Stevens Engineering Society.

The membership of this society, which is affiliated with the American Society of Mechanical Engineers, is made up of students of the Stevens Institute of Technology, Castle Point, Hoboken, N. J. The secretary has just issued a pamphlet containing an outline of the course of lectures which will be delivered at the institute under the auspices of this society during the coming season. All members of the alumni, undergraduates and friends are welcome at these lectures. Following is the list of subjects: "Membership in Engineering Societies," "The Design and Construction of a Central Power Station," "Art and

the Engineer," "The Services of Chemistry in the Promotion of the Public Welfare," "The Story of an Island," "The Origin of Petroleum," "The Kimberley Diamond Mines," "The Development of the Railroad on the North American Continent," "The Catskill Water Supply," "The Electric Furnace," "Reclamation," "Metallography as Applied to Engineering," "Radioactive Phenomena" and "Illuminating Engineering."

American Street & Interurban Railway Association.

The final meeting of this association, the name of which has been changed to the American Electric Railway Association, to which the other three affiliated associations will conform in name, was held on October 13, at Atlantic City, N. J.

The following officers were elected for the ensuing year: Arthur W. Brady, Indiana Union Traction Company, Anderson, Ind., president; Thomas M. McCarter, Public Service Railway, Newark, N. J., first vice-president; George H. Harries, Washington Railway & Electric Company, Washington, D. C., second vice-president; Charles N. Black, United Railroads of San Francisco, San Francisco, Cal., third vice-president, and W. G. Ross, Montreal Street Railway, Montreal, Can., fourth vice-president.

For general comments on the meetings of this association and for a list of exhibitors, see other columns of this issue.

Chicago Signal Club.

The Chicago Signal Club held its regular meeting at the Plymouth building, Chicago, on October 10. The principal topic of discussion was the relative merits of detector bars and track circuits. Although not on the program, an impromptu discussion on the advisability of using hand signaling at interlocking plants brought out some decided opinions. It was announced that at the next meeting, to be held October 24, there will be a talk on "Dry Batteries for Ignition Service" by Hibbard S. Green, of the Nungesser Electric Battery Company. Some excellent data on the use of storage batteries for track circuits will also be presented at this meeting. It will be the regular open meeting and supply men are invited.

Chicago Car Foremen.

The Car Foremen's Association of Chicago held its annual meeting and dinner October 10. The following officers were elected for the coming year: President, W. B. Hall, superintendent equipment, Mather Stock Car Company; first vice-president, George Thompson, division general foreman, Lake Shore & Michigan Southern; second vice-president, P. T. Dunn, master mechanic, Pennsylvania Lines West; treasurer, W. E. Sharp, superintendent, Armour Car Lines; secretary, Aaron Kline, 841 North 50th court, Chicago.

National Association of Railway Commissioners.

Wm. H. Connolly, secretary, Washington, D. C., announces that the twenty-second annual convention of this association will be held in Washington Tuesday, November 15. A number of new committees are to report at this convention and, with other matters of unusual interest, it is expected that this will be the most important meeting the association has thus far held.

American Society of Civil Engineers.

At the meeting held on October 19, 1910, a paper by W. F. Strouse, M. Am. Soc. C. E., entitled "The Reconstruction of the Passenger Terminals at Washington, D. C.," was presented for discussion. This paper was printed in the August number of *Proceedings*.

New York Railroad Club.

At the regular meeting held on Friday evening, October 21, William Marshall, president of the Anglo-American Varnish Company, New York, will present a paper entitled "Protection of Metal Equipment."

Western Railway Club.

At the regular monthly meeting held on the evening of October 18, Paul Synnestvedt read a paper on "The New Commerce Court Act."

MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

- AIR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass.
 AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—A. G. Thomason, Scranton, Pa.; next meeting June 22, 1911; Niagara Falls, N. Y.
 AMERICAN ASSOCIATION OF GENERAL PASSENGER AND TICKET AGENTS.—C. M. Burt, Boston, Mass.; next meeting, St. Paul, Minn.
 AMERICAN ASS'N OF LOCAL FREIGHT AGENTS' ASS'N.—G. W. Dennison, Penn. Co., Toledo, Ohio.
 AMERICAN ASS'N OF RAILROAD SUPERINTENDENTS.—O. G. Fetter, Carew Bldg., Cincinnati, Ohio.
 AMERICAN RAILWAY ASSOCIATION.—W. F. Allen, 24 Park Place, New York; semi-annual, Nov. 16; St. Louis, Mo.
 AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago.
 AMERICAN RAILWAY ENGINEERING AND MAINT. OF WAY ASS'N.—E. H. Fritch, Monadnock Bldg., Chicago; March 21-23, 1911; Chicago.
 AMERICAN RAILWAY INDUSTRIAL ASSOCIATION.—G. L. Stewart, St. L. S. W. Ry., St. Louis, Mo.; May 6, 1911; Detroit, Mich.
 AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, Old Colony Building, Chicago.
 AM. RAILWAY TOOL FOREMEN'S ASS'N.—O. T. Harroun, Bloomington, Ill.
 AM. SOC. FOR TESTING MATERIALS.—Prof. E. Marburg, Univ. of Penn., Phila.
 AM. SOC. OF CIVIL ENGS.—C. W. Hunt, 220 W. 57th St., N. Y.; 1st and 3d Wed., except July and August; annual, Jan. 18-19; New York.
 AM. SOCIETY OF ENGINEERING CONTRACTORS.—D. J. Haner, 13 Park Row, New York.
 AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 29th St., New York; annual, Dec. 6-9; New York.
 AMERICAN ELECTRIC RAILWAY ASSOCIATION.—H. C. Donecker, 29 W. 39th St., New York.
 ASSOCIATION OF AM. RY. ACCOUNTING OFFICERS.—C. G. Phillips, 143 Dearborn St., Chicago; April 26, 1911; New Orleans, La.
 ASSOCIATION OF RAILWAY CLAIM AGENTS.—J. R. McSherry, C. & E. I., Chicago; May, 1911; Montreal, Can.
 ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—G. B. Colegrove, I. C. R.R., Chicago.
 ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, 135 Adams St., Chicago; June 19, 1911; Boston.
 ASS'N OF TRANS. AND CAR ACC. OFFICERS.—G. P. Conard, 24 Park Place, N. Y.; Dec. 13-14, Chicago; June 20-21, 1911, Cape May City, N. J.
 CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk Ry., Montreal, Que.; 1st Tues. in month, except June, July and Aug.; Montreal.
 CANADIAN SOCIETY OF CIVIL ENGS.—Clement H. McLeod, 413 Dorchester St., Montreal, Que.; Thursdays; Montreal; annual, last week January.
 CAR FOREMAN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 North 50th Court, Chicago; 2d Monday in month; Chicago.
 CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York; 2d Friday in January, March, May, Sept. and Nov.; Buffalo.
 ENGINEERS' SOCIETY OF PENN.—E. R. Dasher, Box 704, Harrisburg, Pa.
 ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—E. K. Hiles, 803 Fulton Bldg., Pittsburgh; 1st and 3d Tues.; annual, Jan. 17, 1911; Pittsburgh.
 FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Rich. & Pot. R.R., Richmond, Va.; 20th annual, June 21, 1911; St. Paul, Minn.
 GENERAL SUPERINTENDENTS' ASS'N OF CHICAGO.—H. D. Judson, 209 Adams St., Chicago; Wednesday preceding 3d Thurs.; Chicago.
 INDIANAPOLIS RY. AND MECH'L CLUB.—B. S. Downey, C. & H. & D., Indianapolis, Ind.
 INTERNATIONAL MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York; next convention, Omaha, Neb.
 INTERNAT'L RY. FUEL ASS'N.—D. B. Sebastian, La Salle St. Station, Chicago; May 15-18; Chattanooga, Tenn.
 INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—L. H. Bryan, D. & I. R. Ry., Two Harbors, Minn.
 INT. RY. MASTER BLACKSMITHS' ASS'N.—A. L. Woodworth, Lima, Ohio.
 INTERNATIONAL RAILWAY CONGRESS.—Executive Committee, rue de Louvain, 11 Brussels; 1915, Berlin.
 IOWA RAILWAY CLUB.—W. B. Harrison, Union Station, Des Moines, Ia.; 2d Friday in month, except July and August; Des Moines.
 MASTER CAR BUILDERS' ASS'N.—J. W. Taylor, Old Colony Bldg., Chicago.
 MASTER CAR AND LOCO. PAINTERS' ASS'N OF U. S. AND CANADA.—A. P. Dane, B. & M., Reading, Mass.
 NEW ENGLAND RAILROAD CLUB.—G. H. Frazier, 10 Oliver St., Boston, Mass.; 2d Tuesday in month, except June, July, Aug. and Sept.; Boston.
 NEW YORK RAILROAD CLUB.—H. D. Vought, 95 Liberty St., New York; 3d Friday in month, except June, July and August; New York.
 NORTH-WEST RAILWAY CLUB.—T. W. Flanagan, Soo Line, Minn.; 1st Tues. after 2d Mon., except June, July, August; St. Paul and Minn.
 NORTHERN RAILWAY CLUB.—C. L. Kennedy, C. M. & St. P., Duluth; 4th Saturday; annual, Nov. 26; Duluth, Minn.
 OMAHA RAILWAY CLUB.—A. H. Christiansen, Barker Bldg.; Second Wed.
 RAILWAY CLUB OF KANSAS CITY.—C. Manlove, 1008 Walnut St., Kansas City; 3d Friday in month; Kansas City.
 RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, Pittsburgh, Pa.; 4th Friday in month, except June, July and August; Pittsburgh.
 RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, 12 North Linden St., Bethlehem, Pa.
 RAILWAY S'KEEPERS' ASS'N.—J. P. Murphy, Box C, Collinwood, O.; annual, May, 1911.
 RICHMOND RAILROAD CLUB.—F. O. Robinson; 2d Monday; Richmond.
 ROADMASTERS' AND MAINTENANCE OF WAY ASS'N.—Walter E. Emery, P. & P. U. Ry., Peoria, Ill.; Oct., 1911; St. Louis.
 ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug.; St. Louis.
 SOCIETY OF RAILWAY FINANCIAL OFFICERS.—C. Nvquist, La Salle St. Station, Chicago; Oct. 25 and 26; Hotel Chamberlin, Old Point Comfort, Va.
 SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. R. Ry., Montgomery, Ala.
 SOUTHERN & SOUTHWESTERN R.R. CLUB.—A. J. Merrill, Prudential Bldg., Atlanta; 3d Thurs.; Jan., Mar., July, Sept. and Nov.; Atlanta.
 TOLEDO TRANSPORTATION CLUB.—L. G. Macomber, Woolson Spice Co., Toledo; 1st Sat.; annual, May 6, 1911; Toledo.
 TRANSPORTATION CLUB OF BUFFALO.—J. M. Sells, Buffalo; 1st Sat. after 1st Wed.; annual, Dec. 13; Buffalo.
 TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 290 Broadway, New York; last Tuesday in month, except June, July and August; New York.
 TRAFFIC CLUB OF PITTSBURGH.—T. S. Walters, Oliver Building, Pittsburgh; meetings monthly; Pittsburgh.
 TRAIN DESPATCHERS' ASS'N OF AMERICA.—J. F. Mackie, 7042 Stewart Ave., Chicago; annual, June 20, 1911; Baltimore.
 TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. & H. R., East Buffalo.
 WESTERN CANADA RAILWAY CLUB.—W. H. Rosevear, P. O. Box 1707, Winnipeg; 2d Monday, except June, July and August; Winnipeg.

Traffic News.

The annual meeting of the National Industrial Traffic League will be held at the Congress hotel, Chicago, on October 27.

The Lehigh Valley announces that at the end of this month it will withdraw from all of the car demurrage bureaus to which it belongs.

The Morgan line steamers have made a reduction of 10 cents per 100 lbs.—50 cents to 40 cents—on drygoods and certain similar articles in lots of 10 tons or more from New York to Texas ports.

A press despatch from San Francisco says that all the trans-continental railways are now offering to carry fruit through to Chicago in eight days and to the Atlantic seaboard in ten days—a large reduction from the best time heretofore made.

Hearings on the trunk freight rate cases will be resumed by the Interstate Commerce Commission at Washington November 21. On Tuesday next, October 25, a hearing will be held in Chicago on the western rate question. It is expected that the eastern cases will be brought up for final argument December 14.

The passenger department of the Pennsylvania Lines West of Pittsburgh, in accordance with the wishes of the Pennsylvania State Railroad Commission, will abolish the rule under which it has refused to check baggage through to another line except on a through ticket. This means that a passenger from Fort Wayne (for example) to New York, holding a single trip ticket on the lines west of Pittsburgh and a mileage book for the lines east, can have his baggage checked through. Hitherto a passenger in such a case has been obliged to recheck at Pittsburgh.

Following conferences of bankers in New York during the past week, concerning bills of lading for cotton, it was announced that probably English and American bankers would combine in the establishment of an insurance company to insure the genuineness of such bills. It was estimated that the cost of such insurance would be 6 or 7 cents a bale. Sir Edward H. Holden, the English banker, who was in New York this week, has favored this plan to the extent of telegraphing the European bankers advising them to postpone for two months—October 31 to December 31—their proposed refusal to longer continue the acceptance of bills of lading on the present basis.

Trunk Line Presidents on the Rate Question.

Hearings given by the Interstate Commerce Commission, in connection with its inquiry as to the propriety of increasing long distance freight rates on the roads of the trunk line association, were continued at Washington last week, the principal witnesses being Presidents McCrea, of the Pennsylvania; Willard, of the Baltimore & Ohio, and Brown, of the New York Central, and Vice-President J. C. Stuart, of the Erie.

The first statement was that by Mr. McCrea, and this we give substantially in full in another column. In the cross examination of Mr. McCrea, Mr. Brandeis, representing merchants' associations of eastern cities, asked if the stockholders of the Pennsylvania had not during the past year received the equivalent of 12 per cent. on their stock. Mr. McCrea replied in the negative; and that seems to have been the end of that question. Mr. McCrea said that during the past ten years his employees had had their pay raised 33 per cent., this mainly because of the increase in the cost of living; but in the same time the Pennsylvania stockholders had received no increase whatever in their income from their investments in the road. Clifford Thorne, of Iowa, representing certain shippers, asked questions which seemed to impugn Mr. McCrea's truthfulness. He appealed to the commission for protection and was sustained. Commissioner Lane asked about the present condition of the railway bond market; Mr. McCrea saw no sign of encouragement in the immediate future. As to railway development in new territory, he did not know of any place to get money for such enterprises at present.

Daniel Willard, president of the Baltimore & Ohio, said that during the present year his road had had to raise 50 million dollars, but that bonds could not be sold at a reasonable rate and so it was necessary to sell short time notes. Four-fifths of these will become due in 1913. The increase in the pay-

rolls amounts to \$1,635,000 a year and the increased interest burden is at the rate of \$1,900,000 a year. Railway stock paying less than 6 per cent. is not attractive to the investor. Some years ago investors were willing to accept regular dividends of less than 6 per cent. on the hope of occasional extra dividends, but with the government prescribing transportation rates, investors are no longer willing to take the chance of loss on stock paying such low dividends. Mr. Willard had found investors in Europe this summer extremely anxious to ascertain what the rate situation was going to be in this country.

He estimated that the gross income of the Baltimore & Ohio this year would be 87 millions as compared with 77 millions in 1909; but the increase in net will be only two millions. For every dollar paid in dividends the B. & O. has put 50 cents into improvements. Bankers tell Mr. Willard that the application of one-third of the surplus to improvements is the minimum that should be used in that way.

Mr. Brandeis asked if expenses could not be economized so as to make up for the increased burdens of enlarged pay-rolls, etc. Mr. Willard said he would leave it to the commission to determine whether the railways are managed with sufficient economy. Mr. Willard not only thought that the general basis of rates was too low; but said that this would be his opinion even had there been no recent increase in wages.

W. C. Brown, president of the New York Central, said that the increase made in wages of employees last spring on his line amounted to \$7,831,000 a year. He gave the following details concerning different roads of the system:

N. Y. C.—Increase in pay-rolls, \$3,590,000; additional increase after this year, \$125,000. Lines west of Buffalo. Increase in wages, \$4,200,000; additional next year, \$50,000.

Improvements now going on:

N. Y. C., \$155,000,000, of which 75 millions was expended prior to January 1, 1910; expenditures this year, 42 millions; future years, 38 millions.

Lake Shore & Michigan Southern.—Expenditures, 61 millions; of this prior to January 1, 1910, 30 millions; during current year, 12 millions; future years, 19 millions.

Michigan Central.—Expenditures, \$14,200,000; prior to this year, \$9,700,000; current year, \$3,500,000; future years, \$1,000,000.

Pittsburgh & Lake Erie.—Expenditures, \$9,150,000; prior to this year, \$4,500,000; current year, \$3,400,000; future years, \$1,200,000.

C., C. & St. L.—Expenditures, \$7,300,000; prior to this year, \$660,000; current year, \$6,300,000; future years, \$340,000.

In addition to the improvements included in the foregoing estimates, Mr. Brown said that another hundred millions would be needed for other improvements which would have to be made soon; and among these he mentioned new stations and changes in grades in Utica, Syracuse and Buffalo, and also the following:

"As soon as the plans and details can be agreed to with the authorities of the city of New York, our entire freight line from Spuyten Duyvil to St. John's Park, lying along the west side of Manhattan island, must be rebuilt, including its elevation or depression; electricity must be installed, and new terminals constructed.

"The completion of the four tracking of the main line between Albany and New York, including realignment and necessary station changes.

"The Stuyvesant cut-off, connecting the West Shore with the Boston & Albany south of Albany, in order to send traffic around the congested terminals at Albany." [Stuyvesant station is 18 miles south of Albany and about 10 miles from Chatham on the B. & A.]

Mr. Brown said that a considerable part of the capital for the improvements now in progress was secured before the recent increases in wages rendered the situation acute; but as to future improvements, the money can be obtained only in case the companies can secure increased revenue by means of increased freight rates.

The Michigan Central recently tried to sell 17 millions of 4 per cent. debentures, and that road has a low bonded indebtedness, but the best offer received for these bonds, either in this country or in Europe, was 87. This would have involved a discount of over \$2,250,000 which the company could not stand. The only alternative is to borrow on temporary notes at 6 per cent.

Frank Lyon, counsel for the commission, produced copies of letters showing that the New York Central had made a charge

in the month of March for the entire cost of all ties put into the track during January, February and March, and asked the meaning of this. The letters showed that "certain changes were pending"; but Mr. Brown could not recall that any important changes had been pending at that time.

On cross examination, Mr. Brown said that Mr. McCrea's rule of putting a dollar into the property every time a dollar was paid in dividends was a good rule but that the New York Central had never been able to carry it out. It had not even been able to do as well as the Baltimore & Ohio. During 21 years the New York Central had paid annual dividends averaging 4.76 per cent. and had applied yearly to improvements only 1.27 per cent. Asked if there had been heavy drains on the company, Mr. Brown replied in the negative. The bonded debt of the road is \$254,914,845, and every dollar except 48 millions was borrowed at 3½ per cent.

The proposed increases in rates are not so large as they should be, but if granted, they will make it possible to borrow money in Europe.

"The New York Central stock, every dollar of it," said Mr. Brown, "has been paid for at \$100 a share, except such as was paid for at the rate of \$125 to \$158 a share, and the New York Central cannot be reproduced to-day for 200 per cent. of its total stock and bonds. I say that under oath."

Mr. Brandeis wanted an explanation of the increase in the dividends on the New York Central stock when the directors knew that the employees were soon to demand higher pay. "Did you not thus disab yourself to the extent of \$1,786,000 a year from meeting the increased liabilities?" Mr. Brown replied that the dividends, when increased, were less than what could have been got by the stockholders on first class mortgages.

Mr. Brandeis said he would bring witnesses to show that if the railways were managed with the highest efficiency they could pay their dividends and make the necessary improvements without increasing rates. To this Mr. Brown said that when those men were found he would like to hire five or ten of them; they were just the sort of persons he was looking for.

J. C. Stuart, vice-president of the Erie, testified mainly concerning the operation of the road. He said that the road needed this year budget of \$13,000,000 for general improvements. With this he read a statement of the expenses that must soon be met which gave a total for construction and equipment of \$34,917,588. It is but natural to recognize the impossibility of expecting a railway to be run as economically as a manufacturing plant, for the movement of traffic must go on both day and night, sunshine or storm, and during depressions as well as through prosperous times. Unlike the manufacturing plant, it cannot close whenever business becomes bad. Practically all the repair work of the Erie is done on the piecework basis, and now the road has 70,000 items of work which is done by the piece and paid for by the piece, from repairing a locomotive to the laying of a track.

Commissioner Lane asked the witness if there was anything which cost the roads more now that would be offset by the cutting off of passes and rebates. He said he understood that the roads were claiming that the increased powers of the commission would be a heavy burden and expense to them, but he believed that the same law by eliminating passes and rebates would in that way more than make up for the other expenses. The witness was doubtful of this view.

Feeding the Razorback.

"Hogs can be raised as cheaply in the South as anywhere else, and in many cases more cheaply, but hogs cannot be raised profitably on corn alone," says Prof. Gray in "Farmers" Bulletin 411," in which he gives in full detail the proper methods of feeding hogs in order to realize a profit. Figures are given showing the results obtained from the use of various feeds in experiments conducted at different points in the South. The Southern Railway, which is greatly interested in having the South raise its food supplies at home, will send a copy of this bulletin to any farmer in the South who will address a request to 1300 Pennsylvania avenue, Washington, D. C., or request may be made directly to the department of agriculture.

Prof. Gray gives figures showing the consumption of home raised and western animals in Birmingham, Ala., in 1907, showing that in that year alone more than a million dollars went

out of Birmingham into other states, all of which might have gone into the pockets of southern farmers. Other reasons why southern farmers should raise more hogs are stated as follows:

"Another reason for raising hogs in the South besides that of keeping the money at home is the influence it would probably have on the price of cotton. It will never be possible for the South to control the price of cotton until the southern farmer places himself in such a position that he can hold the crop after it is produced. So long as all the farmers are required to sell the entire crop of cotton each fall, so long will its price be an unreliable and unstable one. The only way by which a farmer can place himself in a position where he will not have to sell all his cotton each fall is to produce something in addition to cotton; and unquestionably one of the best supplements to the cotton crop would be the raising of hogs. The hog business can be so managed that the owner can have money coming in from it at least twice a year, which would enable him to hold his cotton as long as he pleases.

"Furthermore, the hog is especially adapted to the farmer with small capital, as but a small amount of money is required with which to begin the business, and returns begin to come in a few months after it is started. The sow is a rapid producer. Money is turned over rapidly. With \$125 invested in one boar and five to eight sows it is easily possible to have for sale from 5,000 to 8,000 lbs. of pork, live weight, in a year. In other words, the yearly sales should be from two to four times the amount of the investment."

American Association of Passenger Agents.

The annual meeting of the American Association of Passenger Agents was held in Dallas, Tex., last week. The following officers were elected for the next year: President, Charles W. Humphrey, district passenger agent St. Louis & San Francisco, St. Paul, Minn.; vice-president, A. M. Hall, traveling passenger agent Missouri, Kansas & Texas, Dallas, Tex.; secretary-treasurer, G. Gordon Noble, southeastern passenger agent, Lehigh Valley, Philadelphia, Pa. The next annual meeting will be held in Florida, but at what city was not decided. After the convention the delegates went on a trip through Texas over the Missouri, Kansas & Texas, the International & Great Northern, the Galveston, Harrisburg & San Antonio and the Gulf, Colorado & Santa Fe, the trip including stops at Waco, Austin, San Antonio, Galveston, Harrisburg, Houston and Ft. Worth.

The Rock Island's "Breakfast Bacon Special."

The Rock Island recently sent what it called a "Better Hog Train" through Iowa. It was at once nicknamed the "Breakfast Bacon Special," which seems to be a popular designation. The special aroused so much interest among hog raisers in Iowa that it is now to be sent through Missouri, Kansas, Nebraska and Minnesota. The train consists of seven cars, and on its trip through Iowa carried lecturers from the Iowa Agricultural College, who in less than two weeks, it is said, addressed over 20,000 people on hog culture and the use of hog products. Banks, business houses and schools were closed during the visits of the train, and the results promise even greater returns than those from the "Better Seed Wheat Special" recently run by the same road through Oklahoma.

STATE COMMISSIONS.

W. H. Cowgill, a member of the Nebraska railway commission at Lincoln, Neb., died at Lincoln as a result of a paralytic stroke on October 17. He had been a member of the commission since 1908.

The Railroad Commission of Louisiana has held that it is not necessary for the Louisiana Railway & Navigation Co. to have a night agent at New Verda. The evidence showed that the total receipts at New Verda averaged \$147.72 per month. There are two night trains, and the sale of tickets for these two trains ran from \$13.25 to \$11.35 per month, while the cost of a night agent would be at least \$30 a month.

The Railroad Commission of Louisiana holds that when a railway company has opened its ticket office 30 minutes before the

schedule time of departure of a train and kept it open continuously until the train departs, it may require a passenger to show a ticket before entering the train, but if the ticket office is closed after it has been opened, the railway company is liable to a penalty for violation of the rules of the commission.

The Oklahoma corporation commission has issued an order fixing many new class and commodity rates between points in the state. The new scale adopted is much lower for distances under 350 miles than the Texas or Arkansas scale, and is about the same for distances greater than this. The order establishes joint rates between all railways in the state, and requires them to publish joint tariffs, and requires that the tariffs be printed and posted at all stations ten days prior to December 1, when the new rates go into effect.

COURT NEWS.

The Oklahoma supreme court has denied the petition of the Oklahoma railways for an order restraining the corporation commission from enforcing its requirement of reports on the physical valuation of the railways in the state.

The petitions of the western roads for rehearings in what are known as the Missouri river and the Denver rate cases, which the supreme court last spring sustained, the Interstate Commerce Commission in ordering radical reductions in rates, have been denied by the court. The petitions were filed on the day of adjournment of the court.

Judge Kohlsaat, of the federal court at Chicago, issued a temporary injunction on October 12 restraining the Illinois state railway commission from enforcing an order requiring heavy reductions in the rates of the express companies doing business in that state. The injunction was issued on the complaint of the Adams, American, United States, Wells-Fargo and National companies. The express companies filed statements indicating that on present rates they are not making much money in Illinois and that on the rates proposed by the commission they would be unable to earn a fair return.

Judges Sanborn, Hook, Vandeventer and Adams, in the United States circuit court at St. Paul, Minn., on October 10, rendered a decision upholding the findings of Master in Chancery F. N. Dickson, in the suit brought by the Great Northern, the Northern Pacific, the Burlington and the Union Pacific, to test the validity of the order made by the Interstate Commerce Commission two years ago, fixing lumber rates from the Pacific northwest. The rate on lumber from Portland to St. Paul was raised by the roads in the fall of 1907 from 40 cents to 50 cents per 100 lbs. The commission cut the rate to 45 cents, where it is now. The Master recommended a 50-cent rate. The railways made a rate from Portland to Chicago of 60 cents. The commission reduced this rate to 55 cents, and the Master held that the 60-cent rate was reasonable.

Judge Wolverton, of the federal court at Portland, Ore., has issued an injunction temporarily restraining the Oregon railway commission from enforcing an order made by it for a reduction in rates until the reasonableness of the rates and the constitutionality of the law under which the commission acts can be determined. The injunction was issued at the instance of the Southern Pacific and the Oregon & California. While the petitions of these roads attack the constitutionality of the Oregon railway commission act, they call in question mainly the reasonableness of the rates fixed by the commission. The commission's order requires a reduction of 15 to 25 per cent. in rates on 12 classes of freight. Officers of the Southern Pacific estimate that obedience to the commission's order would reduce the earnings of that road about \$300,000 a year. The Southern Pacific claims that its business in Oregon never has been profitable.

President Charles S. Mellen, of the Boston & Maine, has ordered the abandonment of opposition to a suit brought by the attorney-general of the state of New Hampshire to restrain the B. & M. from continuing in effect certain freight rates on leased lines, alleged to be in violation of the statutes. The announcement was made in a letter to Gov. Quinby. Mr.

Mellen says that the road intends to obey the statutes literally and will restore the old schedule in cases where it is found that rates have been raised illegally. In his letter he says:

"Whether the action brought by the attorney-general can be maintained I do not know. I do not know whether the state has the power in authorizing a lease to insist upon a condition which interferes with interstate commerce. But the Boston & Maine Railroad has received benefits in the way of leases under the authority of these statutes and it should not accept the benefits and seek to avoid the obligations.

"I understand that on certain lines there has been no increase of rates in excess of those in force at the time of the passage of these statutes, and that it is difficult to determine as to just what lines these statutes are applicable. I shall be very glad if there is any dispute between the attorney-general and our counsel upon these questions, to have them submitted to the supreme court at the earliest practicable moment for determination."

Hearings in the Harriman Merger Suit.

St. Paul.—Arguments of counsel for defendants in the Harriman merger suit were opened by P. F. Dunne, who said in part:

"The right of the Union Pacific, a state railway corporation, to buy a minority of Southern Pacific stock by out-and-out sale is the point in the case.

"Union Pacific was only an intermediate carrier. It depended on the Southern Pacific from Ogden to San Francisco as its sole rail connection for access to the great business of California. Union and Southern Pacific were connections, not competitors. Solicitation for Atlantic seaboard traffic via Ogden is just as strong as ever by virtue of activity of Union Pacific's eastern connections. The Southern Pacific always did and does solicit this traffic via New Orleans. On interior traffic also the zones of solicitation are unchanged. Business from Atlantic seaboard to Utah and Colorado common points was insignificant and not so much as thought of when the Southern Pacific stock was bought. If the Southern Pacific water line to Galveston and rails north to Ft. Worth are competitive with the Union Pacific which lies west of that point, what lines are not competitive? Portland business from the East or Utah and Colorado points is naturally Union Pacific business. The haul over the Sierras and north over the Siskiyous makes the Southern Pacific route unnatural. The Portland business was relatively insignificant. It is hardly to be supposed that Union Pacific bought the Huntington stock to restrain competition it feared in this business. Between San Francisco and Portland the freight haul by rail is costly and difficult. It is impossible to meet the cheap service by water. On the other hand, passenger business avoids the rough water trip for the scenic rail trip. The Huntington stock certainly was not purchased to protect a couple of steamers hauling a small amount of local business. Traffic into Montana, Idaho and eastern Washington moved by water and rail preferably to paying higher rates by the Southern Pacific rails and connections. This traffic was of absolutely no moment. Union Pacific was a partner with Southern Pacific on the general Oriental traffic by virtue of each owning half the stock in the Occidental & Oriental S. S. Co. All Oriental business of importance inbound came through San Francisco and passed over the Ogden route and Union Pacific rails. This condition was not changed by the merger.

"Actuated by public knowledge that a railway bill would be proposed in the last Congress authorizing purchase of stock of other railways, competing or otherwise, where the purchaser already owned 50 per cent. of the stock, Union Pacific started to increase its Southern Pacific holding to 50 per cent., merely because availing itself of such a provision would, without any derogation from the position that Union and Southern Pacific were related as connecting, not as competing lines, go to displace any issue attempted to be made on that head.

"The policy of the Union Pacific management since 1901 has been to move traffic along the lines of natural commercial gravitation. Shippers are no longer pressed to ship over unnatural routes out of consideration for an agent. They are given the benefit of the best routes.

"To question the acquisition and ownership by a Utah railway corporation of Southern Pacific stock in the market by out-and-out purchase is not within the regulative power of Congress under the commerce clause of the Federal Constitution, but on the contrary pertains to the police power of the State and rests

between the corporation and the State of its domicile. Again, above purchase is not assignable to the categories of section 1 of the Anti-Trust Act either as a contract, combination or conspiracy in restraint of trade, nor can said purchase in the market be said to be monopolizing or attempting to monopolize in respect to interstate commerce with which the second section of the Anti-Trust Act is concerned. The Union and Southern Pacific were not competitors, and therefore their amalgamation was not in violation of the law.

"Congress encouraged by land grants and otherwise the extension of the original Central Pacific both north and south in California. It was the Central Pacific that first put on the Sunset line. The acquisition by Union Pacific of an interest in the Sunset line was incidental only. Evidence shows that Mr. Harriman endeavored to purchase the Central Pacific alone, but was unable. Union Pacific had to have an outlet over the Central Pacific or be bottled up at Ogden.

"The Northern Pacific, Great Northern and Atchison stocks have been sold and these questions are moot and academic.

"The Oregon Short Line had already been constructed to the Utah-Nevada boundary, and the joint line, the San Pedro, Los Angeles & Pacific, is no more than a consolidation of connecting lines, the Clark half of which had not been constructed at the time of the agreement.

"There was no combination of steamship lines to suppress competition. There had been no substantial competition."

In his argument for the defendants N. H. Loomis made the following points:

"The object of acquiring an interest in Southern Pacific was not to suppress competition or to obtain a monopoly, but to secure for Union Pacific an entrance into San Francisco. Rival interests were likely to secure the Central Pacific and bottle the Union Pacific up at Ogden. The consolidation of the two roads was contemplated by Congress when their construction was authorized. Southern Pacific in unfriendly hands would turn eastbound traffic over to the Rio Grande at Ogden.

"Amalgamation of the Union Pacific with the Central Pacific simply advanced the Southern Pacific gateway to Omaha instead of Ogden. It in no wise altered the previous dominant position of the Southern Pacific as to California business by virtue of both its Oregon and New Orleans routes.

"The Supreme Court says Congress 'may prohibit those contracts which directly and substantially, and not merely indirectly and incidentally regulate traffic among the States.' Combining the revenues of both systems arising from the so-called Union-Southern Pacific competitive routes, we find that in 1900, the year prior to the amalgamation, it amounted to 2.89 per cent. of their total revenues.

"The attempted use of the Portland route would result in the destruction of Union Pacific's transcontinental business to California points. The distance from Omaha to Portland is greater than from Omaha to San Francisco. Then there would be a sea voyage from Portland to San Francisco, requiring transfer of freight to ships, with attendant damage. No shipper would use this route at equal rates. No traffic has moved over the route. To open the Portland-San Francisco route at cut rates would result in diversion from Union Pacific at Ogden by Southern Pacific of more business than would be gained. The Union Pacific could not possibly afford to give up its efficient route via the Central Pacific in favor of the inefficient one via Portland. The route via Portland was of absolutely no value as a competitive factor against Southern Pacific.

"The consolidation of agencies would follow the consolidation of connecting lines as naturally as of competing lines and indicates nothing as determining the relation of the Union and Southern Pacific.

"President Jeffrey of the Rio Grande testified: 'Q. The difference lies in the fact that whereas previous to 1901 the Southern Pacific, as between the Rio Grande and Union Pacific, was impartial, since 1901 it has preferred the Union Pacific with un-routed traffic; isn't that the difference? A. That is the difference, yes. The Union Pacific is the preferential connection of the Southern Pacific; that is all there is to it.'

"Instead of depriving the public of facilities, the beneficial results which have flowed from the amalgamation have been manifold. The expenditure of \$363,452,000 on the Harriman lines on extensions and improvements does not indicate an intention to let them be hampered for want of facilities to properly serve the public. The public has been saved \$154,000,000 by fact that

Harriman lines did not advance rates to keep pace with advancing cost of labor and materials. The car movement per day on the Harriman lines is greater than that of almost any other system in the country.

"The act of Congress governing construction and operation of the Union and Central Pacific refers only to the physical connection of the roads as to gage, etc., and in the second place was not intended to control relations between the Union and Central Pacific and their connecting carriers. The Southern Pacific could, without disturbing through rates or divisions, make the Rio Grande a preferred connection just as it has the Union Pacific and with the same effect. Moreover, the Supreme Court has said: 'Different roads forming a continuous line are free to adopt or refuse to adopt joint through tariff rates.'

"Most of the lines alleged by the complainant to be competitive are composed of the railways in question and their connections. Eliminate the connections, and practically no competitive Harriman lines remain. Include the connections, and every railway in the United States is made a competitor of every other railway and with itself.

"A review of the entire record demonstrates that a monopoly has not been created, that there has been no suppression of competition, and that there was no conspiracy to effectuate either purpose. The record shows, on the other hand, that the interest which the Union Pacific acquired in Southern Pacific has been of direct and substantial benefit to trade and commerce."

Frank B. Kellogg, counsel for the government, concluded the complaint's rebuttal and the argument of the case as follows: "In the case at bar we have seen that by the acquisition of less than a majority of its stock the Union Pacific absolutely controls the Southern Pacific. As previously shown, the Union Pacific secured the election of two of its directors as directors of the Atchison, since which time they have been acting in harmony as to rates, in division of traffic, and in agreeing not to enter each other's territory." He then summarized the arguments of the government (printed in the columns last week), and in answer to the testimony showing that the Union Pacific had sold its "investment stocks" said:

"The fact that the Union Pacific has, since the commencement of this suit, sold the balance of its stock in the Great Northern and Northern Pacific, and in the Santa Fe, is no reason why an injunction should not be granted. As we have shown, the evidence is clear in this case that the object in purchasing the stock in the Northern Pacific, with the consequent control of the Burlington, and which, upon distribution of the assets of the Northern Securities Co., vested in the Oregon Short Line a large amount of Northern Pacific and Great Northern stock, and the purchase of the stock in the Santa Fe was to suppress competition between those lines of railway.

"The Union Pacific still has one director on the board of the Santa Fe. The government is entitled therefore to an injunction, although temporarily the stock has been sold. The defendants could easily buy the stock and compel the government to bring another suit.

"The control of the San Pedro, Los Angeles & Salt Lake under the circumstances of this case tended to suppress competition and is void, although that line was not completed at the time of the acquisition of the stock. Bearing in mind that this is not an action under a statute preventing a railway from purchasing stock in a competing line, but an action by the Federal Government to enjoin a restraint on trade, it is evident on principle that competition is restrained by throttling and preventing the construction of competing lines, as well as by controlling the competition of such lines after they are constructed. Competition is not confined to the making of rates on existing lines of railway. It includes extension of railways into competitive country, and this competition may be throttled as well by preventing the construction of independent lines as by controlling those which have already been constructed.

"The combination of steamship lines between American and foreign ports for the purpose of suppressing competition is within the inhibitions of the Sherman Act. Before the acquisition of the Southern Pacific by the Union Pacific each of these systems had a line of steamers running to Oriental ports, competing for that trade. The combination of these lines was as much in violation of the Sherman Act as the combination of competing railways

"We submit that the government is entitled to a decree as prayed in the bill."

REVENUES AND EXPENSES OF RAILWAYS.

MONTH OF AUGUST, 1910.
(See also issues of October 7 and 14.)

Mileage operated, end of period.	Name of road.	Operating revenues				Maintenance		Operating expenses		Net operating revenues (or deficit).	Outside operations, net.	Taxes.	Operating income (or loss).	Increase (or decrease) comp. with last year.
		Freight.	Passenger.	Inc. misc.	Total.	Way and structures.	Of equipment.	Traffic.	Transportation.					
142	Alabama & Vicksburg	\$93,040	\$43,040	\$146,705	\$136,745	\$16,788	\$20,086	\$3,600	\$10,618	\$12,247	\$134	\$4,390	\$49,957	\$20,693
309	Alabama Great Southern	245,016	110,418	355,434	355,434	47,090	85,400	11,105	11,105	124,338	—	11,522	111,942	50,911
301	Ann Arbor	100,349	61,805	162,154	162,154	23,209	22,226	4,692	4,692	59,881	2,683	10,000	48,299	—676
662	Atlanta, Birmingham & Atlantic	157,997	58,821	216,818	216,818	29,510	40,355	14,537	8,411	112,785	—	10,000	46,186	18,878
536	Central Vermont	197,623	123,427	321,050	321,050	61,473	46,566	7,907	107,016	70,088	1,073	10,750	60,411	—52,672
329	Chicago, Indiana & Southern	223,555	33,145	256,700	256,700	43,939	42,835	12,067	103,503	290,054	—	13,575	30,086	—14,612
616	Chicago, Indianapolis & Louisville	406,762	162,560	569,322	569,322	70,629	72,011	16,248	191,089	382,828	—	22,500	228,408	38,454
471	Chicago, Rock Island & Gulf	144,964	60,733	205,697	205,697	45,869	15,944	9,216	84,248	120,667	—311	4,613	52,861	—52,974
337	Cincinnati, New Orleans & Texas Pacific	639,014	156,335	795,349	795,349	86,416	134,994	22,404	201,347	371,566	—170	20,000	351,396	137,523
248	Cincinnati, Northern	97,994	33,158	131,152	131,152	20,914	27,009	4,317	43,817	38,689	—	4,500	34,189	—6,402
337	Colorado Midland	140,044	42,059	182,103	182,103	29,300	35,906	5,769	74,938	97,539	—84	8,500	41,260	20,520
441	Detroit, Toledo & Ironton	155,818	19,183	174,001	174,001	32,683	30,906	2,944	82,858	30,466	—	6,712	23,770	—982
605	Duluth, South Shore & Atlantic	211,024	108,051	319,075	319,075	43,764	67,418	319	174,533	884,007	7,201	50,952	840,256	155,240
310	Elgin, Joliet & Terre Haute	179,059	70,540	249,600	249,600	133,077	165,078	5,189	78,783	126,587	2,681	15,400	111,268	14,608
583	Florida East Coast	699,563	108,051	807,614	807,614	133,077	165,078	5,189	78,783	126,587	2,681	15,400	111,268	14,608
310	Galveston, Harrisburg & San Antonio	1,338	659,994	219,748	919,742	43,504	38,405	4,206	77,921	120,096	—940	9,410	109,746	4,840
307	Georgia	189,870	87,406	277,276	277,276	46,130	39,874	10,365	104,248	300,055	—2,065	13,731	268,790	67,554
789	Houston & Texas Central	318,870	146,576	465,446	465,446	66,687	62,672	11,933	177,192	339,338	—	2,183	30,925	—11,545
886	Lake Erie & Western	410,756	109,294	520,050	520,050	85,761	91,729	14,895	12,309	166,555	—	18,829	147,725	—8,936
390	Long Island	259,835	746,692	1,006,527	1,006,527	114,113	113,855	15,182	410,296	384,195	104,107	43,570	444,732	—52,078
202	Louisiana Western	104,080	50,996	155,076	155,076	15,383	27,843	6,063	45,988	62,040	—	6,077	53,128	—2,554
932	Maine Central	428,364	881,756	1,309,120	1,309,120	105,249	105,249	10,697	183,405	210,000	6,885	35,993	219,812	—97,125
345	Morgan's La. & Tex. R.R. & S.S. Co.	256,942	92,339	349,281	349,281	70,601	50,847	10,987	133,405	116,373	—	8,250	108,451	8,856
196	New Orleans & North Eastern	223,547	69,730	293,277	293,277	26,583	37,730	6,875	96,377	112,486	—	10,000	102,486	—6,409
351	Peoria & Lake Erie	252,143	168,236	420,379	420,379	47,476	52,309	12,937	342,913	902,728	—145	27,200	876,883	19,730
191	Pittsburgh & Lake Erie	1,395,536	1,604,261	3,000,797	3,000,797	188,139	129,937	15,685	342,913	115,465	—	10,798	104,667	—10,741
468	Rutland	169,219	125,578	294,797	294,797	51,564	43,877	11,348	128,279	180,437	—	9,000	171,437	80,093
724	San Antonio & Aransas Pass	292,099	106,612	398,711	398,711	52,525	43,877	4,839	128,279	180,437	—	9,000	171,437	80,093
1,105	San Pedro, Los Angeles & Salt Lake	383,371	220,566	603,937	603,937	135,330	100,689	32,361	210,714	514,502	—3,151	24,612	94,220	—140,662
364	Santa Fe, Prescott & Phoenix	83,497	36,200	119,697	119,697	16,858	11,157	2,607	42,791	90,219	—	100	37,719	—4,669
294	Tennessee Central	87,711	35,829	123,540	123,540	17,858	11,157	5,196	35,222	77,195	—	3,980	49,038	7,254
468	Texas & New Orleans	210,428	87,377	297,805	297,805	58,885	58,885	5,858	110,206	242,993	435	12,182	62,949	—39,291
444	Toledo & Ohio Central	408,402	73,159	481,561	481,561	65,921	66,718	6,873	158,787	200,068	—	15,907	184,161	27,767
171	Vicksburg, Shreveport & Pacific	77,924	43,373	121,297	121,297	17,654	19,906	4,700	38,370	88,737	46	6,375	34,850	8,449
142	Alabama & Vicksburg	\$173,811	\$83,938	\$257,749	\$257,749	\$55,163	\$39,956	\$7,264	\$68,892	\$131,632	—\$85	\$8,780	\$87,939	\$30,876
309	Alabama Great Southern	460,873	218,565	679,438	679,438	94,903	144,473	17,601	17,601	327,898	—1,177	13,424	327,898	50,911
301	Ann Arbor	100,349	61,805	162,154	162,154	23,209	22,226	4,692	4,692	59,881	2,683	10,000	48,299	—676
662	Atlanta, Birmingham & Atlantic	157,997	58,821	216,818	216,818	29,510	40,355	14,537	8,411	112,785	—	10,000	46,186	18,878
536	Central Vermont	197,623	123,427	321,050	321,050	61,473	46,566	7,907	107,016	70,088	1,073	10,750	60,411	—52,672
329	Chicago, Indiana & Southern	223,555	33,145	256,700	256,700	43,939	42,835	12,067	191,089	382,828	—	22,500	228,408	38,454
616	Chicago, Indianapolis & Louisville	406,762	162,560	569,322	569,322	70,629	72,011	16,248	191,089	382,828	—	22,500	228,408	38,454
471	Chicago, Rock Island & Gulf	144,964	60,733	205,697	205,697	45,869	15,944	9,216	84,248	120,667	—311	4,613	52,861	—52,974
337	Cincinnati, New Orleans & Texas Pacific	639,014	156,335	795,349	795,349	86,416	134,994	22,404	201,347	371,566	—170	20,000	351,396	137,523
248	Cincinnati, Northern	97,994	33,158	131,152	131,152	20,914	27,009	4,317	43,817	38,689	—	4,500	34,189	—6,402
337	Colorado Midland	140,044	42,059	182,103	182,103	29,300	35,906	5,769	74,938	97,539	—84	8,500	41,260	20,520
441	Detroit, Toledo & Ironton	155,818	19,183	174,001	174,001	32,683	30,906	2,944	82,858	30,466	—	6,712	23,770	—982
605	Duluth, South Shore & Atlantic	211,024	108,051	319,075	319,075	43,764	67,418	319	174,533	884,007	7,201	50,952	840,256	155,240
310	Elgin, Joliet & Terre Haute	179,059	70,540	249,600	249,600	133,077	165,078	5,189	78,783	126,587	2,681	15,400	111,268	14,608
583	Florida East Coast	699,563	108,051	807,614	807,614	133,077	165,078	5,189	78,783	126,587	2,681	15,400	111,268	14,608
310	Galveston, Harrisburg & San Antonio	1,338	659,994	219,748	919,742	43,504	38,405	4,206	77,921	120,096	—940	9,410	109,746	4,840
307	Georgia	189,870	87,406	277,276	277,276	46,130	39,874	10,365	104,248	300,055	—2,065	13,731	268,790	67,554
789	Houston & Texas Central	318,870	146,576	465,446	465,446	66,687	62,672	11,933	177,192	339,338	—	2,183	30,925	—11,545
886	Lake Erie & Western	410,756	109,294	520,050	520,050	85,761	91,729	14,895	12,309	166,555	—	18,829	147,725	—8,936
390	Long Island	259,835	746,692	1,006,527	1,006,527	114,113	113,855	15,182	410,296	384,195	104,107	43,570	444,732	—52,078
202	Louisiana Western	104,080	50,996	155,076	155,076	15,383	27,843	6,063	45,988	62,040	—	6,077	53,128	—2,554
932	Maine Central	428,364	881,756	1,309,120	1,309,120	105,249	105,249	10,697	183,405	210,000	6,885	35,993	219,812	—97,125
345	Morgan's La. & Tex. R.R. & S.S. Co.	256,942	92,339	349,281	349,281	70,601	50,847	10,987	133,405	116,373	—	8,250	108,451	8,856
196	New Orleans & North Eastern	223,547	69,730	293,277	293,277	26,583	37,730	6,875	96,377	112,486	—	10,000	102,486	—6,409
351	Peoria & Lake Erie	252,143	168,236	420,379	420,379	47,476	52,309	12,937	342,913	902,728	—145	27,200	876,883	19,730
191	Pittsburgh & Lake Erie	1,395,536	1,604,261	3,000,797	3,000,797	188,139	129,937	15,685	342,913	115,465	—	10,798	104,667	—10,741
468	Rutland	169,219	125,578	294,797	294,797	51,564	43,877	4,839	128,279	180,437	—	9,000	171,437	80,093
724	San Antonio & Aransas Pass	292,099	106,612	398,711	398,711	52,525	43,877	4,839	128,279	180,437	—	9,000	171,437	80,093
1,105	San Pedro, Los Angeles & Salt Lake	383,371	220,566	603,937	603,937	135,330	100,689	32,361	210,714	514,502	—3,151	24,612	94,220	—140,662
364	Santa Fe, Prescott & Phoenix	83,497	36,200	119,697	119,697	16,858	11,157	2,607	42,791	90,219	—	100	37,719	—4,669
294	Tennessee Central	87,711	35,829	123,540	123,540	17,858	11,157	5,196	35,222	77,195	—	3,980	49,038	7,254
468	Texas & New Orleans	210,428	87,377	297,805	297,805	58,885	58,885	5,858	110,206	242,993	435	12,182	62,949	—39,291
444	Toledo & Ohio Central	408,402	73,159	481,561	481,561	65,921	66,718	6,873	158,787	200,068	—	15,907	184,161	27,767
171	Vicksburg, Shreveport & Pacific	77,924	43,373	121,297	121,297	17,654	19,906	4,700	38,370	88,737	46	6,375	34,850	8,449

Mileage operated on August 31, 1909: * 640 miles; † 529 miles; ‡ 770 miles; § 257 miles. — Indicates Deficits, Losses and Decreases.

Railway Officers.

ELECTIONS AND APPOINTMENTS.

Executive, Financial and Legal Officers.

J. E. Muhlfeld, until November, 1908, general superintendent of motive power of the Baltimore & Ohio, has been elected vice-president and general manager of the Kansas City Southern, with office at Kansas City, Mo., succeeding Wm. Coughlin, general manager, resigned.

Operating Officers.

A. B. Apperson has been appointed superintendent of the Southern Utah, with office at Price, Utah.

William Coughlin, general manager of the Kansas City Southern, with office at Kansas City, Mo., has resigned.

James Purcell has been appointed transportation inspector of the Atchison, Topeka & Santa Fe, with office at Guthrie, Okla.

F. M. Falck, assistant superintendent of the Philadelphia & Reading at Reading, Pa., has been appointed superintendent of the Wilmington & Columbia division, with office at Reading, succeeding F. S. Stevens, transferred.

W. M. Jeffers, division superintendent of the Union Pacific at Ogden, Utah, has been transferred with his staff to Green River, Wyo. The offices heretofore used by the Union Pacific at Ogden will be used by the Southern Pacific officers only.

C. H. Ewing, engineer maintenance of way of the Philadelphia & Reading and subsidiary companies, has been appointed superintendent of the Atlantic City Railroad and the Cape May, Delaware Bay & Sewells Point, succeeding A. G. McCausland, resigned.

Daniel J. Higgins, trainmaster of the Illinois Central at Champaign, Ill., has been appointed trainmaster of freight terminals, with office at Fordham, Ill., succeeding Charles H. Boone, resigned. W. G. Tiley, a chief train despatcher, succeeds Mr. Higgins.

Herbert H. Adams, who has been appointed general manager of the Toronto, Hamilton & Buffalo, with office at Hamilton, Ont., as previously announced in these columns, was born in August, 1876, at Detroit, Mich. He took a course in civil engineering at the Massachusetts Institute of Technology, receiving the degree of B.S. in 1899. He began railway work in July, 1899, with the Michigan Central, since which time he has been consecutively, December, 1900, assistant engineer; March, 1902, assistant chief engineer; December, 1902, assistant division superintendent, and from February, 1904, to October, 1909, he was division superintendent on the same road. On October 1, 1909, he was appointed general superintendent of the Toronto, Hamilton & Buffalo, which position he held at the time of his recent appointment as general manager.

Fayette R. Rockwell, whose appointment as general superintendent of the Colorado lines of the Denver & Rio Grande, with office at Pueblo, Colo., has been announced in these columns, was born May 2, 1864, at Hornellsville, N. Y. He left high school in 1877 to begin railway work as a messenger boy on the Erie, and remained with that company for six years, being promoted consecutively to caller, telegraph operator and train despatcher. In 1883 he went with the Denver & Rio Grande as train despatcher and was later promoted to chief train despatcher. For two years from 1899 he was superintendent of the Florence & Cripple Creek. He then returned to the Denver & Rio Grande and was superintendent from May, 1901, to November, 1902, and again from November, 1904, to June, 1909. For two years from November, 1902, and from June, 1909, to date he was engaged in private business.

M. C. Roach, whose appointment as superintendent of the New York division of the Lehigh Valley, with office at Jersey City, N. J., has been announced in these columns, was born on August 10, 1870, at New Alexandria, Ohio. Mr. Roach was educated in the public schools, and began railway work with the Pittsburgh, Cincinnati, Chicago & St. Louis on August 10, 1883, and for about three years was a telegraph operator on that

road. In April, 1886, he went to the Erie Railroad in the same capacity, and has been in the continuous service of that company until his recent appointment. He was appointed train despatcher in June, 1890, and from June, 1899, to February, 1900, was chief clerk to the superintendent of transportation. In February, 1900, he was appointed chief train despatcher and four years later was made a trainmaster. He remained in that position from February to December, 1904, when he was promoted to assistant superintendent, which he now leaves to go to the Lehigh Valley as superintendent of the New York division.

James M. Kurn, whose appointment as general superintendent of the Atchison, Topeka & Santa Fe, with office at La Junta, Colo., has been announced in these columns, was born November 10, 1870, at Mt. Clemens, Mich. He received a public school education, and began railway work June 10, 1886, as an operator on the Michigan Central. The next year he was made operator and agent of the Atchison, Topeka & Santa Fe at Millsdale, Ill., and McCook, Ill., and then went to Topeka, Kan., as operator. During the ten years from 1892 he was train despatcher at the following places: Topeka, Arkansas City and Emporia, Kan., and La Junta, Colorado Springs and Pueblo, Colo. He was then made chief despatcher at Pueblo and afterwards trainmaster. He was transferred to Las Vegas, N. Mex., as trainmaster in June, 1905, and later in the same year was made superintendent of the Rio Grande division, with office at San Marcial, N. Mex. The next year he was transferred as superintendent of the New Mexico division to Las Vegas, which position he held until his recent appointment as general superintendent of the Western grand division at La Junta, Colo.

Traffic Officers.

C. W. Taggart, acting general freight and passenger agent of the Baltimore & Ohio Chicago Terminal, has been appointed general freight and passenger agent, with office at Chicago.

John F. Sullivan, traveling passenger agent of the Louisville & Nashville at Houston, Tex., has been appointed a traveling passenger agent of the Houston & Texas Central, with office at Houston.

Fred G. Stehle, city passenger agent of the Union Pacific and the Southern Pacific at Pittsburgh, Pa., has been appointed a traveling passenger agent, with office at Pittsburgh, succeeding W. A. Golden, transferred to the southern California territory.

C. L. Lyons, commercial agent of the Missouri, Kansas & Texas at Joplin, Mo., has been appointed commercial agent, with office at St. Louis, Mo., succeeding R. S. Fife, transferred to New York as general eastern agent. J. J. Daggy, traveling freight agent at Kansas City, Mo., succeeds Mr. Lyons, and B. F. Longley, as has been previously announced in these columns, succeeds Mr. Daggy.

W. L. White, northwestern freight agent of the Pere Marquette at Minneapolis, Minn., has been appointed general agent, with office at Milwaukee, Wis., and will have general charge of all traffic crossing Lake Michigan by car ferries or breaking bulk steamers. E. F. Blomeyer, assistant general freight agent at Milwaukee, having resigned to accept service with another company, that office has been abolished. F. W. Goldie, Pacific coast agent at Seattle, Wash., succeeds Mr. White as northwestern freight agent at Minneapolis, and C. D. Moorhead succeeds Mr. Goldie.

The jurisdiction of J. H. Drake, general freight agent; W. F. Paton, assistant general passenger agent, and V. M. Gutierrez, industrial agent, of the National Railways of Mexico at Mexico City, has been extended over the Vera Cruz & Isthmus and the Pan-American Railroad. C. Cardona, general freight and passenger agent of the Vera Cruz & Isthmus at Mexico City, has been appointed an assistant general freight and passenger agent, and his former position has been abolished; and C. L. Daniel, general freight and passenger agent of the Pan-American at Gamboa, Oax., Mexico, has been appointed an assistant general freight and passenger agent, and his former position is abolished.

C. J. Chisam, commercial agent of the Chicago Great Western at St. Louis, Mo., has been appointed an assistant general freight agent, with office at Omaha, Neb. Ewing Duval has been appointed a general agent, with office at Kansas City, Mo.,

succeeding E. B. McConahy, assigned to other duties. George F. Daniels, traveling freight agent at Peoria, Ill., succeeds Mr. Chisam as commercial agent at St. Louis, and will in addition have charge of the territory handled by him as traveling freight agent. T. M. Smith, traveling freight agent at Chicago, has been appointed a commercial agent, with office at Detroit, Mich., and F. J. Bonavita, also traveling freight agent at Chicago, has been appointed a commercial agent, with office at Cincinnati, Ohio. The offices of traveling freight agent at Peoria and at Chicago have been abolished. These appointments are effective October 24.

Engineering and Rolling Stock Officers.

The office and staff of C. C. VanArsdol, division engineer of the Grand Trunk Pacific at Prince Rupert, B. C., has been transferred from Prince Rupert to Hazelton.

J. Beaumont has been appointed signal engineer of the Chicago Great Western, with office at Chicago, succeeding W. H. Fenley, resigned to engage in other business.

F. S. Stevens, superintendent of the Philadelphia & Reading and subsidiary companies, at Reading, Pa., has been appointed engineer maintenance of way, succeeding C. H. Ewing, transferred. (See an item under Operating Officers.)

L. L. Wood, formerly general foreman of shops of the Evansville & Terre Haute and the Evansville & Indianapolis, and since August acting superintendent of motive power, has been appointed superintendent of motive power with office at Evansville, Ind., succeeding G. H. Bussing resigned.

The jurisdiction of J. M. Reid, chief engineer of the National Railways of Mexico at Mexico City, Mex., having been extended over the Pan-American Railroad and the Veracruz & Isthmus, D. D. Colvin, chief engineer of the Pan-American Railroad at Gamboa, Oaxaca, Mex., has been appointed assistant chief engineer of that company and the Veracruz & Isthmus, with office at Tierra Blanca.

F. H. Murray, who has been appointed master mechanic of the Erie Railroad, at Port Jervis, N. J., as previously announced in these columns, was born February 24, 1875, at Meadville, Pa. He was educated in the high schools and began railway work June 18, 1892, with the Erie Railroad as a machinist's apprentice, and since that time has been in the continuous service of that company. He was appointed a machinist in June, 1896, at Meadville, and was made roundhouse foreman at the same place in November, 1902. He was appointed general foreman at Salamanca, N. Y., in February, 1904, and was transferred in January, 1905, in the same capacity to Jersey City, N. J., which position he held at the time of his recent appointment as master mechanic.

C. L. McIlvaine, who was recently appointed assistant engineer of motive power of the Erie division of the Pennsylvania Railroad and the Northern Central, with office at Williamsport, Pa., as previously announced in these columns, was born September 25, 1876, at Wilmington, Del. He received his education in private schools at Wilmington and Philadelphia, and graduated from the University of Pennsylvania in 1899. Mr. McIlvaine was appointed a special apprentice on the Philadelphia, Baltimore & Washington in the shops at Wilmington in October, 1899, and in January, 1901, he was transferred in the same capacity to the Altoona shops of the Pennsylvania Railroad, remaining in that position until January, 1903, when he was appointed a draftsman in the office of the superintendent of motive power at Jersey City, N. J. In February, 1905, he was promoted to inspector in the same office, and the following May was appointed assistant master mechanic at the Camden shops, Amboy division. Two years later he was appointed assistant engineer of motive power of the Buffalo & Allegheny Valley division, which position he held until his recent appointment.

Paul L. Grove, whose appointment as assistant engineer of motive power of the Buffalo & Allegheny Valley division of the Pennsylvania Railroad, with office at Buffalo, N. Y., has been announced in these columns, was born October 3, 1878, at Altoona, Pa., and was educated in the schools of his native town. He entered the service of the Pennsylvania Railroad in 1894 as a messenger, and two years later began his apprentice-

ship in the Altoona machine shops. He finished his apprenticeship in 1900 and was detailed for special work successively in the offices of assistant engineer of motive power at Altoona, the master mechanic at Pittsburgh, and the road foreman of the Pittsburgh division at Pittsburgh, until he was transferred to the Philadelphia division in 1901 as an inspector in the motive power department. Two years later he was transferred to the Bedford division as foreman at the State Line shop, and the year following he was promoted to assistant master mechanic at Altoona, remaining in that position for five years, until his recent appointment as assistant engineer of motive power.

Purchasing Officers.

Edward Everett Bashford, whose appointment as general purchasing agent of the National Railways of Mexico, with office at Mexico City, Mex., was recently announced in these columns, was born August 13, 1868, at Yonkers, N. Y. He was educated in the public and private schools of his native town, and began railway work September 1, 1888, as stenographer and general clerk in the treasurer's office at New York of the National Railroad of Mexico, now a part of the National Railways of Mexico, and in June, 1890, he was promoted to cashier in the same office. In August, 1892, he was appointed division storekeeper at Mexico City, and from June, 1893, to October, 1897, he was chief clerk of the material department in the auditor's office, of the same company. From October, 1897, to May, 1901, he was chief clerk of the auditor's office, and was appointed assistant auditor in May, 1901, remaining in this position until September, 1902, when he resigned from the service of the National Railroad of Mexico to go to the Mexican General Electric Co., at Mexico City, as accountant. In September, 1905, he returned to railway work as assistant purchasing agent, and assistant secretary, at New York, of the National Railroad of Mexico and subsidiary companies. In November, 1908, he was made assistant purchasing agent of the Mexican Central in New York, and on the consolidation of the N. R. R. of M. and the M. C. he was appointed assistant secretary of the new company, the National Railways of Mexico, and secretary of the New York local board of directors, which he now leaves to become general purchasing agent of the same company and subsidiary lines at Mexico City.

Special Officers.

Major Charles Hine, special representative of the director of maintenance and operation of the Harriman Lines, is on leave of absence, and has been appointed temporarily special representative on the staff of the president of the National Railways of Mexico, and will do special organization work on these lines.

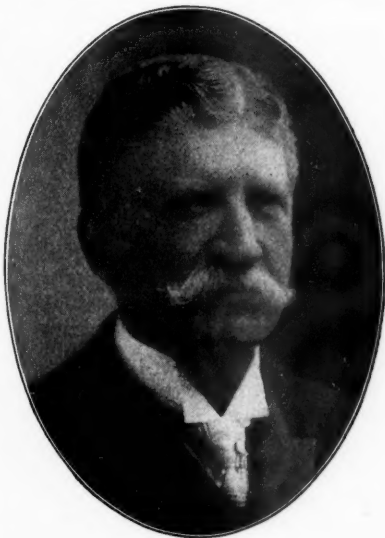
OBITUARY.

Samuel B. Sweet, until May, 1908, general freight agent of the Lake Erie & Western at Indianapolis, Ind., died at his home in Indianapolis on October 12, at the age of 65 years. Mr. Sweet was born near Ft. Wayne, Ind., and began railway work in 1866 as a bill clerk for the Toledo, Wabash & Western, now a part of the Wabash. Three years later he became chief clerk and for ten years from 1874 was general agent; he then became division freight agent at Peru, Ind., and in 1887 he was appointed assistant general freight agent of the Lake Erie & Western. He was promoted to general freight agent at Indianapolis in 1896, and held that position until he retired in 1908.

W. W. Peabody, formerly vice-president and general manager of the Baltimore & Ohio Southwestern, died at his home in Cincinnati on October 14. Mr. Peabody was born at Gorham, Me., in 1836, and began railway work in 1852. He was with the Marietta & Cincinnati successively as assistant engineer, president's private secretary, paymaster, master of transportation and general manager, until 1877, when he became general superintendent and general manager of the Ohio & Mississippi; for three years from 1883 he was president and general manager. He then became manager of the trans-Ohio division of the Baltimore & Ohio. In January, 1890, he became vice-president of the Baltimore & Ohio Southwestern, and when that road consolidated with the Ohio & Mississippi as the Baltimore & Ohio Southwestern in 1893, he became vice-president and gen-

eral manager of the consolidated property, from which position he retired in 1898.

Warren G. Purdy, who was president of the Chicago, Rock Island & Pacific from June, 1898, to December, 1901, died at his home in Chicago on October 13. Mr. Purdy was born May 20, 1843, at Baltimore, Md., and began railway work in 1859 as a clerk in the office of the Illinois Central at Chicago. Almost all of his railway career was on the Rock Island, he having entered the service of this road as a bookkeeper in the cashier's office at Chicago in 1867, and having risen to an executive officer through the financial department. During the 11 years that he was second vice-president and first vice-president (1887 to 1898) he was the right-hand man of R. R. Cable, then president, and it was at Mr. Cable's instance that he was promoted to succeed him as president.



Warren G. Purdy.

Mr. Purdy served during the civil war as chief clerk in the quartermaster's department of the U. S. Army and took a considerable interest in military matters later. For four or five years in the 80's he was lieutenant-colonel of the Second Illinois Infantry, and in that capacity took an active part in helping to put down a strike of large proportions for those days in the Chicago stockyards. He was also very much interested in the Masonic order and became a thirty-third degree mason. In 1880 he was adjutant-general at the Knight Templars' conclave.

When Mr. Purdy entered the service of the Rock Island it had less than 500 miles of line and did not extend west of the Missouri river. It was during the period that he was vice-president that the road's mileage was most rapidly increased, and, as its chief financial officer, he was most active in providing the funds for its development. The period during which he was president was not one of extensive so much as of intensive development. The road was then engaged in strengthening its hold on the large territory of which it had in the preceding years taken possession. Mr. Purdy was not a brilliant man in the sense in which that word is ordinarily used, but he was a very resolute, courageous, solid, hard-working one. In 1894, when the American Railway Union strike under the leadership of Eugene Debs took place in Chicago, he was second vice-president and the active executive of the road. He was among those railway officers who believed in standing their ground against labor union walking delegates who sought to dictate to them how the railways should be run, and during the time when the fighting was fiercest he borrowed two cots from a hotel near the Rock Island station, put them in the station, and he and George H. Crosby, now vice-president, secretary and treasurer of the road, slept on them every night for two weeks. He wanted to be near the scene of action when any fighting for the protection of the rights of the company was apt to have to be done. He was, in a sense, an "old-fashioned" railway president. That is, he thought that the business of the president of a road was to run it in the interests of the public and the stockholders, and not to spend most of his time gratifying the curiosity of state railway commissions regarding matters which are really of no consequence to the public so long as the public is well served by the railway. It was this attitude of mind that caused him, when the Iowa railway commission asked him to inform it what salaries the Rock Island paid its president and other officers, to send word that "that was none of the Iowa railway commission's business."

A number of years ago Mr. Purdy was injured in a railway wreck and he subsequently suffered from a spinal trouble which he supposed was traceable to this accident.

Railway Construction.

New Incorporations, Surveys, Etc.

ALBERTA CENTRAL.—Three grading outfits are at work, it is said, between Red Deer, Alberta and Rocky Mountain House. Grading and construction work is going on at Medicine river, four miles north of Evarts. J. A. Graham has a contract for some of the work. J. T. Moore, president; J. G. MacGregor, chief engineer, Red Deer.

ALTUS, LUBBOCK & ROSWELL.—Grading on a section of about 60 miles from Memphis, Tex., southwest to Lockney, will be finished early in December, it is said, and arrangements are now being made for the construction of the bridges between Memphis and Cap Rock. From Lockney the line is to be built southwest via Lubbock, thence west to Roswell, N. Mex., about 150 miles. It is announced that several hundred thousand dollars of cash subsidy and large bonuses, that were donated in aid of the project, have been taken over by the Texas Construction Co., of Memphis, Tex., and Kansas City, Mo. This company is backed by the Empire Construction & Finance Co., Kansas City, which is constructing the line.

AUGUSTA NORTHERN.—An officer writes that work is now under way building from Ward, S. C., on the Southern Railway, north via Bell to Saluda, 12 miles. Contract has been let to the Independent Construction Co., Ward. Track laying will be started between December 1 and 15. Maximum grades will be 1.5 per cent. and maximum curvature eight degrees. Bids are being asked for a plate girder bridge, to be 60 or 70 ft. long, to be built over Red Bank creek, at Saluda. The company will also put up three stations, one section house and a railway shop. M. C. Woods, president, Marion, and T. C. McNeeley, secretary and general manager, Ward.

CANADIAN PACIFIC.—An officer of the Esquimalt & Nanaimo writes that contracts for grading are to be let by the end of October, for work on the Cowichan branch between Duncans, B. C., and Cowichan lake.

CAROLINA, CLINCHFIELD & OHIO.—An officer writes regarding the reports that an extension is to be built from Elkhorn City, Va., north, that surveys for an extension north of Elkhorn City have been made for some time and certain revisions of this line are now being made. He adds that there is no more assurance at the present time that the extension will be built than there has been during the past five years.

CHESAPEAKE & OHIO.—The directors have authorized an expenditure of \$850,000 for improvements to be carried out during the current fiscal year, to be made on the line between Cincinnati, Ohio, and Chicago. The improvements and additions include the construction of 14 new side-tracks, the filling of the big trestle at Cincinnati, important additions to the facilities of the switching yard at Summit, outside of Cincinnati, ballasting and grade revision. The work has already been started and will probably be completed before June 30, 1911. This is part of the plan to bring the newly acquired road between Cincinnati and Chicago up to the physical standard of the Chesapeake & Ohio proper, in order that it may handle some of the through business now going over the Big Four. The traffic agreement with the Big Four will probably remain in force for some time or until the Chesapeake & Ohio of Indiana will be ready to handle all of the Chicago traffic with economy.

CHICAGO, MILWAUKEE & PUGET SOUND.—An officer writes regarding the reports that improvement work is to be carried out at St. Joe, Mo., that some time in the future a tunnel will be pierced through the Cascade mountains at a lower elevation than the present crossing. The company has located the line, because at the west end some excavating, to secure material which is immediately needed for filling bridges, will be done.

COLORADO ROADS (ELECTRIC).—Surveyors are now at work securing right-of-way, it is said, for a line from Pueblo, Colo., east to La Junta, about 70 miles. J. S. Vail, Pueblo, is said to be back of the project.

CROSBYTON-SOUTH PLAINS.—An officer writes that work is under way by W. H. Denison, Lubbock, Tex., from Lubbock, easterly to Crosbyton, about 40 miles. One-half mile of track has been laid. Maximum grades will be 0.6 per cent. and maximum curvature 3 degs. The principal outbound traffic will be

cattle and farm products. John A. Knox, chief engineer, Lubbock. (July 22, p. 174.)

ESQUIMALT & NANAIMO.—See Canadian Pacific.

FAIR VIEW & INTER-MOUNTAIN.—An officer writes that the owners of the Fair View coal mine of Fort Collins, Colo., are back of a project to build from Delta, Colo., to Fair View coal mine, 16 miles. From this line at a point about four miles from the mine, a branch is to be built to Cedaredge, about five miles. Another branch is to be built from Delta, along the California mesa to its upper end in Montrose county; surveys have not yet been made for this branch. The most difficult part of the grading is finished. Contracts will be let for track laying and bridge work as soon as the bonds are placed. There will be one steel bridge over the Gunnison river. W. Ziegler, president, Fort Collins, and C. G. Mantz, secretary, 1154 Clark-street, Denver.

GEORGIA & FLORIDA.—A contract is said to have been given to John F. Lamb, Thomasville, Ga., to build 1.5 miles of line through the city of Valdosta, Ga.

LEXINGTON & EASTERN.—An officer writes that contracts have been let in sections of about 18 miles each, and work is being carried out by the following contractors: Lane Brothers Co., Alta Vista, Va.; Mason & Hanger Co., Richmond, Ky.; Jones Brothers, Columbus, Ohio; W. J. Oliver, Knoxville, Tenn., and the Luck Construction Co., Roanoke, Va. This work is on an extension from Jacksonville, Ky., up the north fork of Kentucky river to a point about three miles above Whitesburg, about 88 miles. There are several tunnels and a number of river crossings on this section. The grade is 0.3 per cent. compensated down the river or against loads, and 0.5 per cent. compensated up the river or against empties. Contracts are to be let as soon as surveys are finished for an additional section of 12 miles up Boone's Fork. The line is being built to develop the coal and timber lands in that section. J. E. Willoughby, chief engineer construction, Louisville, Ky. (Sept. 30, p. 599.)

MAINE CENTRAL.—Plans have been made for the construction of a new short line to Brunswick, Me., connecting the main line west of the station with the Lewiston branch north of the station, also for the construction of new coal pockets at Brunswick. These improvements are part of a plan for new routing of freight between Portland and towns and cities on the Androscoggin river. The distance will be greater but the heavy grades near Danville Junction and Walnut Hill will be avoided.

MASSILLON & BREWSTER AIR LINE (ELECTRIC).—An officer writes that the prospects of building from Massillon, Ohio, south to Brewster, about eight miles, are good. It has not yet been decided when contracts will be let for the work. The plans call for putting up a power house.

NATIONAL RAILWAYS OF MEXICO.—Surveys are finished and plans are now in the hands of the government for approval, it is said, for a line from Tampico, Mexico, north to Matamoros, near the mouth of the Rio Grande, about 300 miles, where connection is to be made with the Frisco system.

Official announcement is made that the government of the state of Durango has granted a subsidy of \$600,000 to the National Railways of Mexico for the construction of the line from Durango, Mex., southwest to Gutierrez, Zacatecas, on the old main line of the Mexican Central. The subsidy applies only to that portion of the line through the state of Durango, about 50 miles. It is understood that a subsidy will be granted by the state of Zacatecas covering the section of the line through that state. (Oct. 14, p. 711.)

NEVADA & CALIFORNIA.—See Southern Pacific.

OSAGE & WESTERN.—An officer is quoted as saying that grading will be resumed within 30 days from Billings, Noble county, Okla., east towards Fairfax, Osage county. The company was organized to build from Enid, Okla., east to Vinita, 178 miles. R. H. Hoss, president, Fairfax; C. Walters, general manager, and E. J. Noonan, locating engineer, both of Muskogee. (Sept. 2, p. 440.)

PACIFIC & IDAHO NORTHERN.—An officer writes that the extension of this line from Evergreen, Idaho, northeast to New Meadows, 15 miles, is nearing completion. There are 20 bridges on this section, of which 14 are completed. Grading is 85 per

cent. finished and track laying has just been started. Maximum grades are 2 per cent. and maximum curvature 12 degs., the grade being compensated on the curves. The line will be laid with new 65-lb. Bessemer rail, with continuous joints. It is expected to have the line in operation by December 1 of this year. (July 29, p. 206.)

PITTSBURGH & SHAWMUT.—An officer writes that the Pittsburgh & Shawmut has 35 miles of line finished, connecting with the Pittsburgh, Shawmut & Northern. Work is now under way by the Pittsburgh & Shawmut, building about 100 miles additional to complete the line south via Knoxdale, Pa., along Mahoning creek to Mahoning, thence over the Allegheny river and along the west bank to Freeport. A contract has been let to James H. Corbett, Kitanning, to build the line, and the bridge work is being done by the American Bridge Co., Pittsburgh. The work is heavy and includes five tunnels and seven trestles. It is expected that the entire line will be finished before January 1, 1912. Edwin E. Tait, president, Bradford; Dwight C. Morgan, vice-president and general manager, and W. W. Henshey, chief engineer, both of Kitanning.

PITTSBURGH, SHAWMUT & NORTHERN.—See Pittsburgh & Shawmut.

SANDY RIVER & RANGELEY LAKES.—The Railroad Commissioners of Maine recently issued a certificate of necessity for taking land at Phillips, Me., for the purpose of carrying out improvements. The plans call for additional tracks, stations, coal sheds, wood sheds, repair shops and car, engine and freight houses.

SOUTHERN PACIFIC.—According to press reports, work on the Nevada & California, from Mojave, Cal., north to Lonepine, Inyo County, 150 miles has been finished.

SOUTHERN RAILWAY.—The report of this company for the year ended June 30, 1910, shows that no new construction of importance was undertaken during the year, but that the work under way during the previous year has been prosecuted. This work included a revision of grade and double-tracking the main line south from the terminal yard at Monroe, Va., across the James river, through the city of Lynchburg, thence across the Staunton river to Sycamore, a total of 38.14 miles, shortening the old line 2.16 miles. The operation of the revised line through Lynchburg was postponed by a disastrous fire in the new tunnel while still incomplete and in charge of the contractor. This delayed the completion of the work, but it is now expected that the new line will be put in operation this fall. The double-track operated on the main line has been increased during the year by the completion of second-track between Spencer, N. C., and Concord, 24.07 miles; between Harrisburg and North Charlotte, 8.27 miles, and north from Greensboro, 1.80 miles. The heavy work on 13.67 miles of revised line and double-track between Citico, Tenn., and Ooltewah (the approach to Chattanooga, Tenn., from the east), has been prosecuted throughout the year, and is nearing completion. The improvements to provide new terminal facilities, including new passenger and freight stations, and increased yard facilities at Jellico, Tenn., were finished during the year, and new transfer facilities at Inman yard, near Atlanta, Ga., were under construction at the close of the year. At Atlanta, the freight station and other improvements are still incomplete, nothing having been done on them during the year. Miscellaneous station buildings at various places were put up during the year. Additional tracks and facilities at Charlotte, N. C., and Mobile, Ala., were completed, and at the close of the year there was in course of construction tracks and approaches for the new passenger terminal station at Birmingham; additional tracks and facilities at North Birmingham; similar work at Hamburg, S. C., and an interchange yard at Montview, Va. The enlargement of shop facilities, including new machinery and tools at Coster, Tenn., has progressed during the year. (See report of this company elsewhere in these columns.)

WISCONSIN & NORTHERN.—A concession has been granted this company to build five miles of line through the Menominee-Indian reservation, it is said, where a large amount of timber damaged by fire must be taken out at once. It is understood that the company will build the extension from Shawano, Wis., south to Appleton as soon as financial arrangements can be made.

Railway Financial News.

ANN ARBOR.—See Detroit, Toledo & Ironton.

BOSTON & ALBANY.—Frank G. Webster has been elected a director, succeeding Henry B. Chapin, deceased.

BOSTON & MAINE.—President Mellen is quoted as saying: "There is nothing in the Boston & Maine situation calling for a reduction in the common dividend. * * * We may be called on to show a deficit this year after the demand of 6 per cent. on common stock, but we can later on make it good."

BOSTON RAILROAD HOLDING CO.—This company has asked permission of the Massachusetts Railroad Commission to issue \$20,012,000 4 per cent. preferred stock in exchange for the outstanding like amount of 4 per cent. bonds. These bonds are held by the New York, New Haven & Hartford.

BUFFALO, ROCHESTER & PITTSBURGH.—The New York Stock Exchange has listed \$177,000 additional consolidated mortgage, 4½ per cent. bonds, of which \$67,000 bonds were issued to pay for \$1,200,000 stock of the Silver Lake Railway. The Silver Lake runs from Perry, N. Y., to Silver Springs, seven miles.

CHICAGO & ALTON.—This company has bought for \$250,000 the Toluca, Marquette & Northern. This is a 31-mile line in the coal district of Illinois and crosses the Chicago & Alton's line at Custer. The company also owns 12,000 acres of undeveloped coal lands. The Toluca, Marquette & Northern has \$150,000 stock and \$970,000 bonds.

CHICAGO, BURLINGTON & QUINCY.—Holders of the \$5,551,000 Hannibal & St. Joseph 6 per cent. bonds which mature March 1, 1911, are offered the privilege of exchanging their bonds for general mortgage 4 per cent. bonds of the C., B. & Q. at the rate of one C., B. & Q. 4 per cent. bond with interest coupon due March 1, 1911, attached and \$10 in cash, for each Hannibal & St. Joseph bond without interest coupon due March 1, 1911, and the holder of this interest coupon may discount it for cash at 4 per cent. or hold it until maturity.

CHICAGO GREAT WESTERN.—Judge Sanborn in the United States Circuit Court has approved an agreement by which the Chicago Great Western assumes all the leases and traffic agreements entered into in 1901 between the Wisconsin, Minnesota & Pacific and the old Chicago Great Western Railway.

DETROIT, TOLEDO & Ironton.—Under a decree made by Judge Swan, of the United States District Court, sitting as circuit court judge, H. L. Baker, as special master, will sell on November 25, at New York, in collateral deposited under the \$5,500,000 5 per cent. notes of 1905. This collateral consists of \$5,000,000 consolidated mortgage 4½ per cent. bonds, \$3,001,000 preferred stock and \$2,190,000 common stock of the Ann Arbor.

GRAND TRUNK.—The company has asked the Canadian Parliament to give it power to make a number of changes, among others, to hold one annual meeting instead of two semi-annual meetings and to make an annual report instead of semi-annual reports; to make dividend payments semi-annually; to guarantee interest at 4 per cent. on an issue of the Grand Trunk Western, first mortgage 50-year bonds.

GREAT NORTHERN.—R. A. Jackson has been elected a director, succeeding H. W. Cannon, resigned.

KANAWHA & MICHIGAN.—The minority stockholders' committee that succeeded the Mackey committee has been dissolved and members of the committee have sold their stock and the stock they represented, presumably to the Chesapeake & Ohio interests. This is the committee that obtained an injunction against the retirement of the Hocking Valley preferred stock.

KANSAS CITY, MEXICO & ORIENT.—The company has asked the London Stock Exchange to list script representing \$5,000,000 4 per cent. 50-year first mortgage bonds, representing bonds sold last July.

MACON & BIRMINGHAM.—John B. Munson, vice-president and general manager of the Georgia, Southern & Florida, has been

appointed receiver of the Macon & Birmingham, succeeding S. F. Parrott, deceased.

MEXICAN NORTHERN.—Of the original issue of \$1,660,000 6 per cent. bonds, all except \$708,000 have been retired by the sinking fund. The \$708,000 not retired are due December 1, 1910, and the company offers to extend these bonds to 1930 at 6 per cent., or to purchase the bonds at par and interest.

MEXICAN RAILWAY.—The directors have declared three-quarters of 1 per cent. dividend on the ordinary shares for the half year ending June 30, 1910, and have declared the full annual dividends of 8 per cent. on the first preferred and 6 per cent. on the second preferred stock. In 1909 no dividends were paid on the ordinary stock; 2¾ per cent. was paid on the second preferred stock and the full 8 per cent. was paid on the first preferred.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—The New York Stock Exchange has listed \$3,607,000 additional first consolidated mortgage 4 per cent. bonds, of which \$3,600,000 were issued to pay for extensions, additions and betterments, and \$7,000 to retire a like amount of Minneapolis & Pacific first mortgage bonds.

NEW YORK CENTRAL & HUDSON RIVER.—Wall street rumors credit the New York Central & Hudson River with plans that include: Purchase of the Wabash-Pittsburgh Terminal, which would secure another entrance into Pittsburgh; control of the Wheeling & Lake Erie, which would give the New York Central lines another outlet to the lakes; joint control with the present owners of the Western Maryland, which would give the New York Central an outlet at Baltimore when the new line which the Western Maryland is building from Cumberland to a connection with the Pittsburgh & Lake Erie has been completed; purchase of the Virginian Railway, and construction of the Virginian with the Kanawha & Michigan to form a through line from Toledo in connection with the Lake Shore, the Toledo & Ohio Central and Kanawha & Michigan to tidewater at Norfolk.

NEW YORK, NEW HAVEN & HARTFORD.—See Boston Railroad Holding Co.

NORFOLK SOUTHERN.—Through the sale of first mortgage bonds of the new company, under the plan of reorganization, the new company is to retire the \$1,980,000 Norfolk & Southern notes which fall due November 1. The \$1,000,000 receivers' certificates dated December 29, 1908, have been called for payment on November 10, 1910.

NORTHERN CENTRAL.—Townsend Scott & Son, Baltimore, in explaining their reason for opposing the lease of the Northern Central to the Pennsylvania Railroad say that the income of 11.2 per cent. which the lease would afford on par value of the present stock, should be compared, not with the present 8 per cent. rate but with the 8 per cent. rate plus the average amounts received by way of stock dividends, etc., which have raised the annual return to the stockholders during the last ten years to 20 per cent. They say that the Northern Central could be compelled to pay at least 11.2 per cent., notwithstanding the opposition by a controlling interest. The meeting to vote on the lease will be held November 2.

PENNSYLVANIA RAILROAD.—White, Weld & Co., New York, have bought from the company and are offering to the public \$1,000,000 Allegheny Valley general mortgage 4 per cent. bonds guaranteed, principal and interest, by the Pennsylvania Railroad. Offering price is 100¼ per cent.

ROME & CLINTON.—In explanation of the reduction of the semi-annual dividend from 3½ per cent. to 3 per cent. paid in July, the company says that owing to the corporation income tax it becomes necessary to slightly reduce an occasional dividend. It is expected that the usual 3½ per cent. will be paid in January.

The Swiss have just begun on a tunnel under the Furka Pass, which will pass a railway from Brieg, at the north end of the Simplon Tunnel in the Rhone valley, northeastward to Disentis, in the upper Rhine valley, crossing the Gothard Railway on the way.

Supply Trade Section.

At the annual stockholders' meeting of the American Locomotive Co., New York, held on October 18, the former directors of the company were re-elected.

The Westinghouse Electric & Manufacturing Co., Pittsburgh, Pa., has received from the Boston & Maine a contract for the entire equipment for the electrification of the Hoosac tunnel under the Hoosac Mountain in Massachusetts.

The Isthmian Canal Commission will receive bids until November 7 for hose, hose couplings, oil cups, cocks, saws, chucks, punches, reamers, track gages, cabin-door hooks, screen-door latches, metallic tapes, emery cloth, shellac, etc. (Cir. No. 610.)

The Northern Engineering Works, Detroit, Mich., recently shipped two 10-ton, 60-ft. span electric traveling Northern cranes to the Detroit Bridge & Steel Works, and two 7½-ton cranes to the Lenoir Car Works. The Kewanee Boiler Company is installing four 5 to 15-ton electric traveling Northern cranes made by this same company.

C. H. Peterson, heretofore in the Chicago office of the Baldwin Locomotive Works, Philadelphia, Pa., and the Standard Steel Works Company, Philadelphia, Pa., has been appointed southwestern representative of these companies, with office at 914 Security building, St. Louis, Mo. Edward B. Halsey, who has been in charge of the St. Louis office, was transferred to the sales department of the Philadelphia office.

The exhibit of the R. D. Nuttall Company, Pittsburgh, Pa., at the convention of the American Street and Interurban Railway Association at Atlantic City, N. J., included a pneumatic pantograph trolley of this company's latest type for service where conditions provide low clearance, a design that is used on the New York Central Lines. Another interesting feature of the exhibit was in connection with the butt welded reinforced trolley poles.

The Gisholt Machine Company, Madison, Wis., and Joseph T. Ryerson & Son, Chicago, have announced an association of interests in the manufacture and sale of machinery and machine tools. Extensive additions will be made at once to the Gisholt plant which will greatly increase the output of that company, and permit of development which the association of one of the leading machine tool builders with a strong machinery organization would seem to prophesy.

The following locomotives, recently ordered, were equipped with superheaters manufactured by the Locomotive Superheater Company, New York:

Northern Pacific	18	Pacific
Chicago, Rock Island & Pacific	50	Pacific
St. Louis & San Francisco	12	consolidation
Chicago & Alton	20	Mikado
Minneapolis, St. Paul & Sault Ste. Marie	6	consolidation
New York Central & Hudson River	10	Pacific
Baltimore & Ohio	1	Mallet
Chicago & North Western	5	Pacific and
	30	consolidation

Judge Kohlsaat, of the federal court at Chicago, has issued an injunction restraining the Ryan Car Company and the Lemack Carriers' Company from infringing on patents obtained by Frank X. Mudd, general manager of the Live Poultry Transportation Company, for improvements on poultry cars. The title to the patents is now in the name of the Live Poultry Transportation Company, and bears the number of 539,229. The ascertaining of what damages the defendant companies shall pay to the plaintiff was delegated to James S. Hopkins as master in chancery.

The Signal Appliance Association at its annual meeting, held in Richmond, Va., last week, in connection with the Railway Signal Association, elected for the ensuing year the following officers: A. F. Klink, Bryant Zinc Co., chairman; H. M. Buck, Railroad Supply Co., vice-chairman; Frank Edmunds, Dressel Railway Lamp Works, secretary; H. M. Sperry, General Railway Signal Co., treasurer. The executive committee consists of the officers and Avery P. Eckert, National India Rubber Co.; Azel Ames, Kerite Insulated Wire & Cable Co.; Fred A. Poor, Rail Joint Co., and J. S. Hobson, Union Switch & Signal Co.

The exhibit of the Westinghouse Companies, Pittsburgh, Pa., at the convention of the American Street and Interurban Rail-

way Association at Atlantic City, N. J., was in its usual location in the main building. The principal exhibit of the Westinghouse Traction Brake Company was a rack representing a complete equipment for a 10-car subway or elevated train of motor or trailer cars, furnished with the latest electro pneumatic brake system and Westinghouse governor synchronizing system for distributing the work of supplying the compressed air equally among all compressors in the train. The Westinghouse Electric & Manufacturing Company exhibited a complete working outfit of its new type HL multiple unit control for street and interurban lines, connected to two 40-h.p. railway motors, loaded by Prony brakes. A large number of detail parts of the control apparatus were also shown. The Westinghouse single phase system was represented by the No. 135 motor, which has a capacity of 75 h.p. operated on 25-cycle, and 90 h.p. operated on 15-cycle. This is the motor used by the New York, New Haven & Hartford, and will also be used by the Boston & Maine in connection with the electrification of the Hoosac tunnel. The Westinghouse Machine Company showed a Westinghouse-Leblanc condenser, with air and circulating pumps direct-connected to a 15-h.p. Westinghouse steam turbine. The Westinghouse Lamp Company had on exhibition one of each size of its 110-volt wire type tungsten lamps.

Charles W. Reinhoehl, superintendent of the frog and switch department of the Pennsylvania Steel Company, Steelton, Pa., was killed at Buena Vista, N. J., Sunday, Oct. 9, by the overturning of the automobile which he was driving. H. G. Barbee and W. R. Miller, employees of the same company, who were also in the automobile, were injured. The party was on its way from Steelton to Atlantic City to attend the convention of the American Street and Interurban Railway Association. The car is said to have been running at the speed of 15 miles an hour. Mr. Reinhoehl was seen to rise and wave his hand to friends who were in a car following. At that moment his car skidded toward the side of the road and nearly overturned. It again changed its course sharply for the opposite side of the road; then a wheel broke and the car turned over twice. At the first turn Mr. Reinhoehl was thrown out into the road and received injuries from which he died in a few minutes. H. F. Martin, general sales manager for the company, who was at Atlantic City, went at once to Buena Vista and took charge of the body, which he sent to Steelton, where the funeral was held Wednesday, Oct. 12. Mr. Reinhoehl leaves a widow. He was born at Lancaster, Pa., in 1860, and had been continuously in the service of the Pennsylvania Steel Company for 27 years. He entered the employ of the company as a machinist, and as he passed through all grades of promotion to the head of the frog and switch department, he became one of the most widely known men in that special work in the country.

Exhibition of Railway Appliances at the Coliseum, Chicago, March, 1911.

Preparations are now being made for the annual exhibition of railway appliances used in the construction and maintenance of steam and electric railways, which will be given by the Railway Appliances Association, formerly the Road and Track Supply Association, at the Coliseum, in Chicago, March 20 to 25, inclusive, 1911, the week during which the American Railway Engineering and Maintenance of Way Association will hold its twelfth annual convention and the Railway Signal Association will hold its spring meeting. The arrangement of the floor space will be practically the same as last year, with the exception that, owing to the large number of applications being received, it will be necessary to use the balcony in addition to the main floor and the annex. The price will be the same, 40 cents per sq. ft., on the main floor and annex, but will be only 25 cents per sq. ft. on the balcony. The first allotment of space will be made on or about November 1, 1910, by the Working Board of the Executive Committee of the Railway Appliances Association; therefore it is advisable to have all applications for space in the hands of the secretary before that date. Address John N. Reynolds, secretary, Plymouth building, 303 Dearborn street, Chicago.

TRADE PUBLICATIONS.

Tie Preservatives.—The Indian Refining Company, Cincinnati, Ohio, has just issued a pamphlet describing its Indian Timberasphalt, used in connection with the preservation of railway ties.

Bolt and Rivet Headers.—The National Machinery Company, Tiffin, Ohio, in a leaflet just issued, illustrates and describes its National 1½-in. wedge grip, bolt and rivet header for making square or hexagon head bolts or rivets.

Water Softener.—The L. M. Booth Company, New York, has just issued a leaflet describing its type G water softener. A half-tone illustration illustrates the mechanical parts which are installed at the top of this softener.

Ventilators for Interurban Cars.—Burton W. Mudge & Company, Chicago, have issued a folder describing their Garland car ventilators for use on interurban street, elevated, subway or tunnel cars, with monitor deck and high or low elliptical roofs.

Kerosene Torches.—The Hauck Manufacturing Company, New York, in its pamphlet No. 31, describes a torch for the use of kerosene instead of gasoline. This torch is suitable for general shop work and is said to be more efficient and powerful than the gasoline torch.

Freight and Package Conveyor.—The Link-Belt Company, Nicetown, Philadelphia, Pa., in book No. 83, gives a large number of illustrations, with general information of a large number of installations of a type of conveyor which this company manufactures for handling freight and packages.

Farlow Draft Gear.—Catalogue A, just issued by T. H. Symington Company, Baltimore, Md., gives a very complete description of the Farlow draft gear. A number of excellent half-tone engravings, in phantom style, show this draft gear and its attachment to and position between the center sills.

Lighting Fixtures.—Bulletin No. 9,635 of the Western Electric Company, New York, illustrates and describes the Hawthorn commercial and folding type mazdaliers lighting fixtures which have been developed since the advent of the mazda lamp. A portion of the bulletin is devoted to the anti-jar link suspension which is described as a simple yet effective means of protection against vibration.

Cardwell Draft Gear.—"Mike" is the title of the latest publication by Bruce V. Crandall, advertising the Cardwell friction draft gear made by the Union Draft Gear Company, Chicago. Mr. Crandall states that this is his latest attempt "to get away from the stereotyped advertisement," but no apologies are necessary, as the story and illustrations will make interesting reading for any railway man, whether he is a "son of Erin" or not.

Electric Equipment.—The Crocker-Wheeler Company, Amper, N. J., has just issued bulletin No. 120, which supersedes bulletin No. 100, on form I, belt type d. c. motors and generator; bulletin No. 125 on Remek type transformers of light and power; bulletin No. 122, superseding bulletin No. 101, on form D, belt type d. c. generator and motors, and bulletin No. 123, superseding bulletin No. 89, on adjustable speed motors.

RAILWAY STRUCTURES.

CHAMBERSBURG, PA.—The Cumberland Valley will begin work soon on a two-and-a-half story brick office building on Kennedy street, in Chambersburg.

DELTA, COLO.—See Fair View & Inter-Mountain under Railway Construction.

DES MOINES, IOWA.—The Chicago, Burlington & Quincy is trying to secure property on which to locate a large freight house, but up to the present time has been unsuccessful.

EXCELSIOR SPRINGS, MO.—The Chicago, Milwaukee & St. Paul is remodeling and building an addition to its passenger station. The addition is of frame and the work has already begun.

HARLOWTON, MONT.—The Chicago, Milwaukee & St. Paul is building a five-stall addition to its roundhouse. A similar addition is being made to the roundhouse at Three Forks, Mont., and a new two-stall frame engine house is being built at New England, S. Dak. This work is all well under way.

LAKELAND, FLA.—Plans are being made by the Atlantic Coast Line for building up a new passenger station at Lakeland.

LEWISTON, ME.—The Lewiston & Auburn Board of Trade is back of a movement to secure a union passenger station in Lewiston.

LIMA, OHIO.—The Ohio Electric Railway formally opened its new interurban station at Lima on October 16. The building is a handsome one, covering nearly a city block, and cost between \$60,000 and \$75,000. The upper floors are given over to executive officers and train dispatchers.

LOS ANGELES, CAL.—The Southern Pacific will build a draw-bridge over the channel into the west basin at San Pedro harbor. An addition of 50 ft. x 160 ft. is being built by Wells, Fargo & Co. at the Santa Fe station in Los Angeles.

The county supervisors are asking for bids for putting up a concrete bridge, 165 ft. long, across Arroyo Seco, between Los Angeles and South Pasadena. The San Pedro, Los Angeles & Salt Lake will pay part of the cost of the improvements for the privilege of having a 16-ft. right-of-way over the structure.

MASSILLON, OHIO.—See Massillon & Brewster Air Line (Electric) under Railway Construction.

MONTROSE, PA.—Surveys have been completed by the Scranton & Binghamton for a viaduct to be built over the Delaware, Lackawanna & Western tracks at Montrose.

NEW ENGLAND, S. DAK.—See Harlowton, Mont.

NEW MEADOWS, IDAHO.—Work has been started on a new passenger station for the Pacific & Idaho Northern at New Meadows. The building will be of brick construction, faced with pressed brick, two stories high, 42 ft. x 105 ft., and will be equipped with steam heat, electric lights and modern improvements. (See Pacific & Idaho Northern under Railway Construction.)

NORRISTOWN, PA.—The Chamber of Commerce will ask the county commissioners to build jointly with the Philadelphia & Western a bridge over the Schuylkill river.

OTTAWA, ONT.—Plans are under consideration for putting up a combined highway and street railway bridge over the canal at Bank street in Ottawa.

PHILLIPS, ME.—See Sandy River & Rangeley Lakes under Railway Construction.

PRINCETON, IND.—Officials of the Southern Railway recently made arrangements to rebuild on a larger scale the shops at Princeton which were damaged by fire, with an estimated loss of \$150,000.

RENO, NEV.—Press reports state that the Southern Pacific intends to build a new passenger station and office building.

ST. LOUIS, MO.—The Missouri, Kansas & Texas Terminal Company has received a building permit for a \$100,000 two-story freight house. The building will be located at 1600 North Broadway, and work is to be rushed with the expectation of having it ready for use January 1, 1911.

SALEM, N. Y.—The New York Public Service Commission, Second district, has ordered the Greenwich & Johnsonville, to begin at once the construction of an overhead crossing at the Cambridge-Salem turnpike in Salem, Washington county.

SALUDA, S. C.—See Augusta Northern under Railway Construction.

SPRINGFIELD, OHIO.—The new station for the Ohio Electric in Springfield will be completed in about a month.

THREE FORKS, MONT.—See Harlowton, Mont.

TIA JUANA, MEX.—The San Diego & Arizona will build a bridge over the Tia Juana river, 500 ft. long, and another bridge over the Matanuca creek, 180 ft. long. Both structures will have steel towers.

TRENTON, OHIO.—Work on the Ohio Electric Company's bridge over the Miami river, near Trenton, on the Cincinnati & Dayton division, is rapidly nearing completion. Six or seven new concrete piers are being built, and some important work on the C., H. & D. overway, nearby, is also progressing rapidly. When this work is completed early in the spring a cut-off will be available, saving several miles and reducing the running time between Cincinnati and Dayton appreciably.

TUCSON, ARIZ.—The Southern Pacific shops at Tucson, which were destroyed by recent fires, are to be rebuilt at once at a point east of the former location.

Late News.

The items in this column were received after the classified departments were closed.

The Grand Trunk Pacific has made an arrangement with the Canadian Government to operate that part of the National Transcontinental running from Winnipeg to Superior Junction.

Judge Holland in the United States Circuit Court has denied the motion of the Pennsylvania Railroad Co. for a non-suit in the action brought against it by the 11 coal companies which charge discrimination in car distribution.

F. A. Markley has been appointed a commercial freight agent of the Baltimore & Ohio, succeeding E. N. Kendall, promoted, and E. H. Smith has been appointed a traveling freight agent, succeeding W. K. Davis, promoted, both with offices at Toledo, Ohio.

Edgar Freeman, cashier of the New York Central & Hudson River, at New York, has been appointed assistant treasurer of the Lake Shore & Michigan Southern, the Michigan Central and the Cleveland, Cincinnati, Chicago & St. Louis, with office at New York. A. W. Elliman succeeds Mr. Freeman, with office at New York.

The Texas railway commission has been notified that the sale of the Rio Grande Railroad to William E. Guey, of St. Louis, representing, it is said, St. Louis & San Francisco interests, would stand, the minority stockholders having been unable to file a bond for \$125,000 as a guarantee that the road would bring at least that at a second sale.

George H. Eaton, assistant general freight agent of the Boston & Maine, at Boston, Mass., has been promoted to general freight agent, with office at Boston, succeeding Thomas A. Dugan, deceased. Abel E. Prescott, chief of rate bureau, has been promoted to assistant general freight agent. D. J. Flanders, passenger traffic manager at Boston, has been retired on account of ill health. This position is not to be filled at the present time. F. E. Brown, assistant general passenger agent at Concord, N. H., has been promoted to first assistant general passenger agent, and F. T. Grant, chief clerk, has been promoted to assistant general passenger agent.

At the annual meeting of the stockholders of the Illinois Central at Chicago on Wednesday Attorney Maxwell Edgar, who held 60 shares of stock, was present, with two deputy sheriffs, who served subpoenas on the directors in a suit for \$10,000,000 damages, which Mr. Edgar has started in the circuit court. The defendants are the directors, whom Mr. Edgar seeks to hold responsible for alleged financial loss through car repair graft, general mismanagement and rebating. Mr. Edgar said that, in addition to representing 60 shares of stock, he spoke for a special committee of stockholders, including Secretary MacVeagh, of the United States Treasury, and others. Three resolutions were introduced by Edgar, but all were lost by an overwhelming vote. Mr. Edgar has been prominent in the filing of suits against corporations for the collection of back taxes, which he says are still due the state of Illinois to the extent of many millions of dollars. President Harahan said that he attached no weight to Edgar's suit.

The Interstate Commerce Commission has made the following order in regard to the long and short haul clause of the amended act: "That until February 17, 1911, carriers may file with the commission, in manner and form as prescribed by law and by the commission's regulations, such changes in rates and fares as would occur in the ordinary course of their business, continuing under the present rate basis or adjustments higher rates or fares at intermediate points and through rates or fares higher than the combinations on the intermediate rates or fares, provided that in so doing the discrimination against intermediate points is not made greater than that in existence on August 17, 1910, except when a longer line or route reduces rates or fares to the more distant point for the purpose of meeting by a direct haul reduction of rates or fares made by the short line. The commission does not hereby approve any rates or fares that may be filed under this permission, all such rates and fares being subject to complaint, investigation and correction if they conflict with any other provisions of the act."

Equipment and Supplies.

LOCOMOTIVE BUILDING.

The Pacific & Idaho Northern has ordered two 10-wheel locomotives from the Baldwin Locomotive Works.

The Raleigh & Southport has ordered one 10-wheel passenger locomotive from the Baldwin Locomotive Works.

The Stuttgart & Rice Belt, George C. Lewis, De Valls Bluff, Ark., a new line building in Arkansas, will soon be in the market for motive power.

The Crosbyton-South Plains, a steam railway building between Lubbock, Tex., and Crosbyton, is in the market for motive power. John A. Knox, chief engineer, Lubbock.

The Chicago Junction Railway, reported in the *Railway Age Gazette* of September 30 as having ordered five six-wheel switching locomotives from the American Locomotive Company, has increased this order to seven.

CAR BUILDING.

The Lehigh Valley is in the market for 50 steel coaches and three steel combination parlor-buffet cars.

The Stuttgart & Rice Belt, George C. Lewis, De Valls Bluff, Ark., a new line building in Arkansas, will soon be in the market for rolling stock.

The Crosbyton-South Plains, a steam railway building between Lubbock, Tex., and Crosbyton, is in the market for car equipment. John A. Knox, chief engineer, Lubbock.

The Massillon & Brewster Air Line, J. G. Wise, Massillon, Ohio, an electric line building between Massillon, Ohio, and Brewster, is figuring on the purchase of electric cars.

The Winston-Salem Southbound, reported in the *Railway Age Gazette* of September 23 as being in the market for 100 box and 50 gondola cars, is building the gondolas in its own shops.

The Chicago, Burlington & Quincy, reported in the *Railway Age Gazette* of September 23 as being in the market for six steel postal cars, has ordered this equipment from the American Car & Foundry Company.

The Boston Elevated, reported in the *Railway Age Gazette* of October 14 as being in the market for 100 passenger cars, has added 30 all-steel elevated cars to its inquiry. The 100 passenger cars are for the surface lines.

The Galveston-Houston Electric Railway has ordered 12 interurban cars through the Stone & Webster Engineering Corporation. The order includes 10 passenger cars and two express cars to be built by the Cincinnati Car Company. The passenger cars are 52 ft. long, will seat 54 passengers and have smoking compartments.

IRON AND STEEL.

The Baltimore & Ohio is in the market for 400 tons of bridge steel.

The Chesapeake & Ohio is in the market for 1,000 tons of bridge steel.

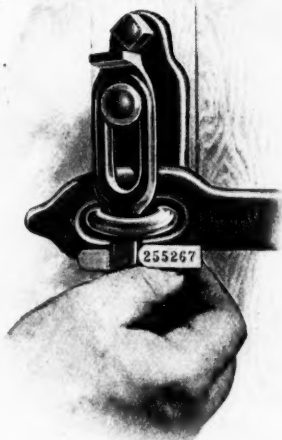
The Pennsylvania is in the market for 200 tons of bridge steel for a bridge at Trafford, Pa.

The New York, Westchester & Boston is in the market for 2,000 tons of structural steel for trolley bridges.

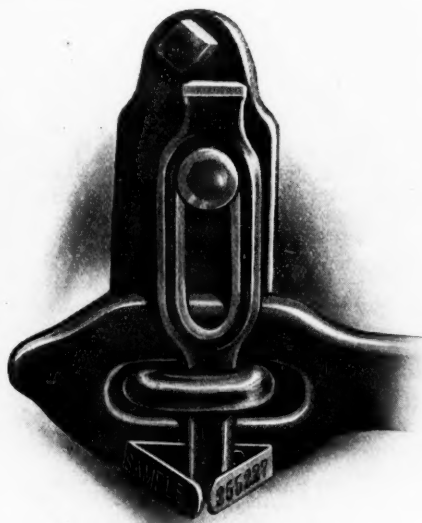
General Conditions in Steel.—C. M. Schwab, president of the Bethlehem Steel Co., is quoted as saying that the present conditions in the steel business are worse than at any time since he became president of the company. General sentiment continues cheerful, the steel men being uniformly confident of an early revival of activity in all branches of the industry.

Metal Car Seal.

The Metal Car Seal Company, Iola, Kan., has perfected a simple and efficient means of sealing box cars. A seal to furnish effective protection must seal the car in such a way that it cannot be tampered with and re-used; its identification mark must be very legible so as to eliminate errors in reading and in recording, and the seal should not be capable of duplication

**Application of Metal Car Seal.**

The seal made by this company consists of a single stamping of metal with the initials of the company and identification number stamped in its face, two triangular notches cut on one edge and extending about three-fourths of the way across the seal, and a small circular hole for stringing the seals on a wire for shipment.

**Metal Car Seal Applied.**

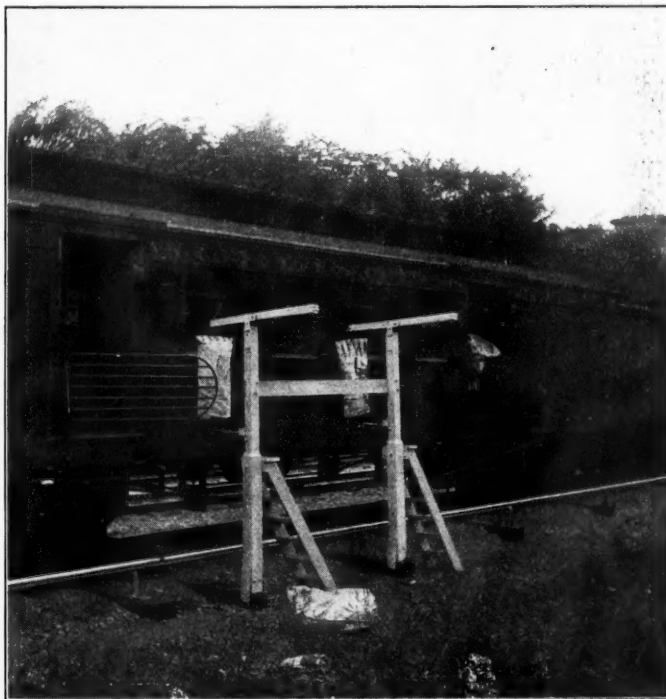
In operation the seal must be used in connection with a car pin having a rectangular hole. The seal is inserted in this hole and the ends bent up at the notches, forming a triangle with the initials and identification number outside. The act of bending up the ends breaks the metal just enough to insure

its breaking off if an attempt is made to straighten it. The surface of the metal is coated with tin so that it is impossible to treat the seals by heating before their application so that they will stand the rebending. In case heat is applied, the tin is melted, and the fact that the seal has been tampered with is shown by its change in color.

The manufacturers assert that two-thirds of the freight cars now in use are equipped with car pins with which this seal can be used, and that it would not be expensive for the remaining third to be so equipped. The advantages claimed for the seal are that it is cheap, easy to apply, positive in its indication of tampering, and easily readable. The cuts shown herewith illustrate the application of this metal car seal to the rectangular hole of the pin and its appearance after application.

Automatic Mail Catcher.

A demonstration of a new mail catching device patented by the Railway Automatic Mail Device Company, Chicago, recently was given on the Burlington at Western Springs, Ill., near Chicago. The illustration shows two posts with bags full of mail hanging therefrom. Any number of posts may be used so that more than one bag of mail may be taken readily into the car while the train is passing at any speed. At the car door there is a grating made of iron pipes which is attached to a vertical

**Automatic Mail Catcher.**

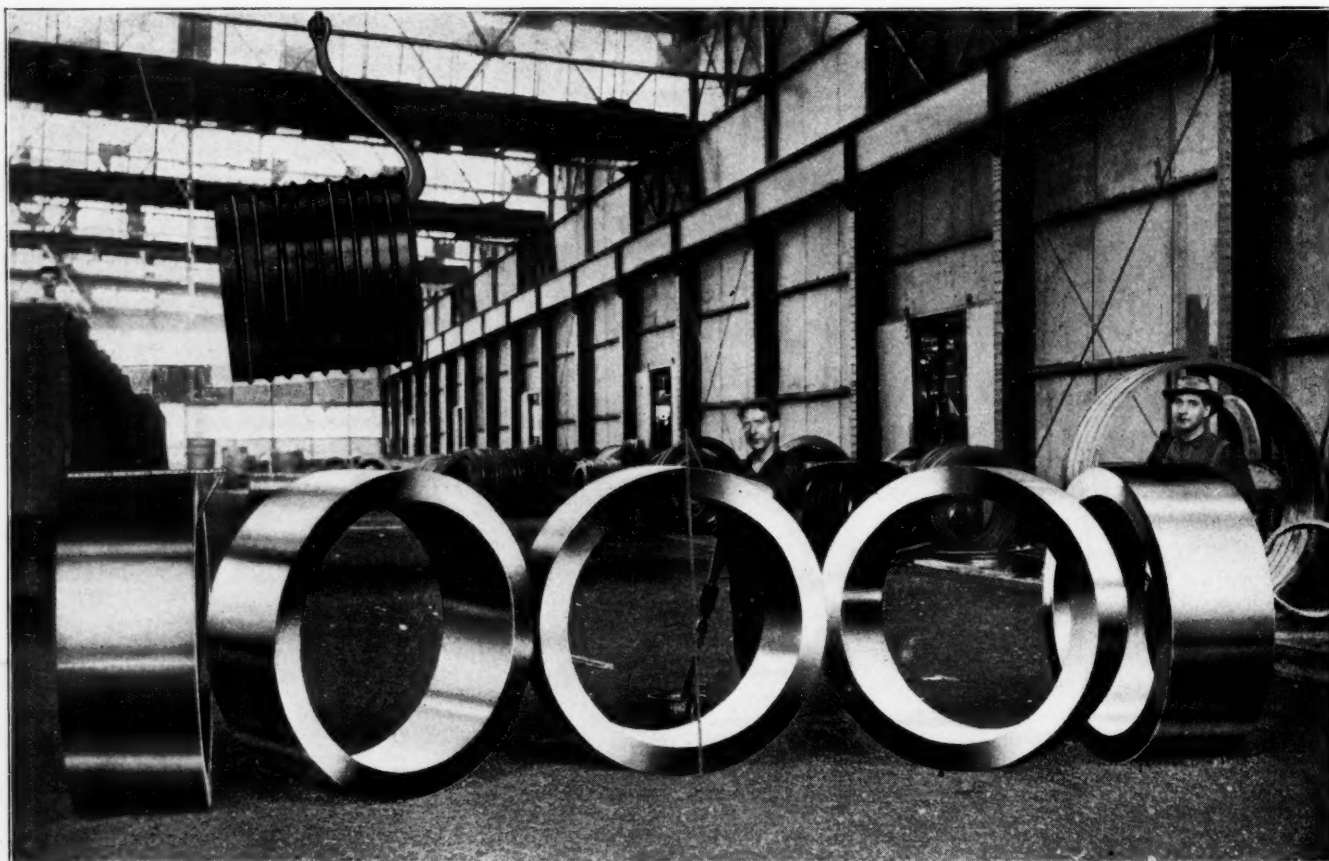
post going through the floor of the car and extending down to within about 18 in. of the level of the rail. At the lower end of the post is an arm with a hook on one end, the normal position of the arm being parallel with the side of the car and pointing upward. Short standards are set on the ends of the ties for some distance each side of the post to which the mail bag is attached, these standards carrying a pipe rail. The pipe rail is only a few inches higher than the track rail and is parallel with it except at the ends, which are bent toward the track. As the train approaches the mail post an operator in the car depresses a lever with his foot. This drops the arm so it engages with the curved end of the guide rail which carries the end of the arm out until it stands at an angle of 30 deg. with the side of the car. The movement of the arm causes the frame on the door to swing out at the same angle. The frame in this position sweeps the bags into the car without grasping them, so full bags are handled without injury and all shock is transmitted to the door frame. The bags are attached to the post by means of clips on the ends of arms, as in ordinary cranes, and the impact of the frame as the train goes past detaches the bag, and

it is slid along the frame fast enough to carry it into the car before it can fall.

To throw mail from the car, an iron pin which hangs from the side of the car is raised to rest on the top of the frame, pointing upward to serve as a hook. The bag to be thrown off is hung to this pin outside the frame and is thrown off as the frame is moved out when the lower arm strikes with the guid-

Large Steel Shells Made by the Inter-Ocean Steel Company.

The new plant of the Inter-Ocean Steel Company at Chicago Heights, Ill., is now in full operation, and is turning out a large number of locomotive and car wheel tires per day, and, in addition, it is manufacturing steel-tired car wheels and rolled steel rings. The illustration herewith indicates the great width and weight of the rings which it is possible to roll. These rings,



Interior of Inter-Ocean Steel Company's Tire Storehouse, Showing Method of Loading Tires; Also Steel Shells, 20 in. wide x 5 in. thick.

ing pipe rail. The frame can be changed to the other side of the door frame by two men in less than one minute. In the other door of the car, the front door in the illustration, the end of a pile of bags is shown resting on another device owned by the same company and used for the purpose of discharging second class mail. A movable platform which lies flat on the floor until required for use is attached to the floor by means of hinges. When approaching a station the platform is raised and the bags of mail placed on it. As the train passes the station the operator depresses a lever with his foot, which action causes an arm to drop and engage with the guide rail on the ground. When the straight part of the guide rail is reached the frame moves forward and down by means of hinges, lowering the platform and casting the mail from the car. Both devices are automatic in action after the operator presses the lever in the car floor. In the demonstration at Western Springs 600 lbs. of second class mail were discharged from the car with the train moving at a speed of 45 miles an hour. The experiments mentioned were made at speeds of 10 miles to 45 miles per hour without any accident or failure, and were watched by a number of railway men. An immediate result of the tests was a request from the Burlington to be permitted to equip the entire line from Chicago to St. Paul, 34 stations, as well as the four mail cars running in that service, for a six months' test. The superintendent of the Railway Mail Service granted permission for this six months' test on September 24, and work has been started. The Canadian Post Office has given permission for a six months' test of this automatic mail catcher, on the Canadian Pacific near Ottawa.

or shells, are 54 in. outside diameter, 5 in. thick and 20 in. wide on the face, weighing 4,404 lbs. each. They were forged under a 5,000-ton press and rolled in the tire-rolling machines. It is believed that this is the heaviest section ever rolled into this shape. The Inter-Ocean Steel Company is equipped to forge and roll rings of larger diameter and width than have ever been attempted heretofore in this country.

FOREIGN RAILWAY NOTES.

The railway employee Zeis, tried on the charge of having caused by his negligence an accident at Uhersko, in Austria, last Christmas, has been sentenced by the court which tried him to six months' imprisonment.

It is said that when the Arica to La Paz Railway, Chile, is completed, which should be within 18 months, the time from the Pacific coast to La Paz will be reduced for passengers from 23 to 14 hours, and for freight from four days to 25 hours.

A press despatch from Port-au-Prince, Hayti, says that the beginning of the construction work on the new railway, the concession for which to an American syndicate, headed by James P. McDonald, of New York, was recently ratified by the Haytian government, was celebrated to-day at Gonaives. Representatives of the government took part in the celebration.

ANNUAL REPORT.

SOUTHERN RAILWAY COMPANY—SIXTEENTH ANNUAL REPORT.

Washington, D. C., October 6, 1910.

To the Stockholders of the Southern Railway Company:

The Board of Directors submit the following report of the affairs of the Company for the year ended June 30, 1910:

INCOME STATEMENT.			
	1910.	1909.	Increase or decrease.
Miles of Road Operated, Ave.	1,050.17	7,170.36 Dec.,	120.19
Gross Operating Revenues...	\$57,294,508.34	\$52,188,106.64 Inc.,	\$5,106,401.70
Total Operating Expenses ...	38,635,745.94	35,568,980.60 Inc.,	3,066,765.34
Net Operating Revenue ...	\$18,658,762.40	\$16,619,126.04 Inc.,	\$2,039,636.36
Outside Operations—Net Rev.	18,980.36	136,963.39 Dec.,	117,983.03
Net Revenue	\$18,677,742.76	\$16,756,089.43 Inc.,	\$1,921,653.33
Taxes Accrued	1,979,722.33	1,916,701.65 Inc.,	63,020.68
Operating Income	\$16,698,020.43	\$14,839,387.78 Inc.,	\$1,858,632.65
Other Income	3,179,135.72	2,898,311.70 Inc.,	280,824.02
Total Gross Income	\$19,877,156.15	\$17,737,699.48 Inc.,	\$2,139,456.67
Interest on Funded Debt and Equipment Obligations...	\$11,313,686.11	\$11,314,538.85 Dec.,	\$852.74
Other Deductions from Total Gross Income	2,806,451.43	2,833,775.21 Dec.,	27,323.78
Total Deductions	\$14,120,137.54	\$14,148,314.06 Dec.,	\$28,176.52
Balance, Income over Charges	\$5,757,018.61	\$3,589,385.42 Inc.,	\$2,167,633.19
Additions and Betterments...	52,372.91	78,285.18 Dec.,	25,912.27
Balance carried to Credit of Profit and Loss.....	\$5,704,645.70	\$3,511,100.24 Inc.,	\$2,193,545.46

There was at the close of this fiscal year, a balance to be absorbed of \$7,684,604.46 in discount on securities, resulting principally from the large sales of Development and General Mortgage Bonds in the year ended June 30, 1909. In transferring the balance of income over charges for the year ended June 30, 1910, to the credit of Profit and Loss, the Board of Directors deemed it proper to charge \$2,831,459.89 of this discount to Profit and Loss, thus reducing the amount still to be absorbed to \$4,853,144.57. The net balance remaining to the credit of Profit and Loss as of June 30, 1910, after such credit and debit was \$8,685,959.91.

This discount is being charged off partly by proportionate charges to Income during the life of the securities and partly by extraordinary charges to Profit and Loss. The charge to Profit and Loss this year will result in substantial reductions in such charges to Income during subsequent years in disposing of the balance now in the account.

Statements of the accounts and statistics of the Company, in the usual detail, will be found in the tables hereto annexed.

The accounts have been examined, as usual, by Certified Public Accountants, Messrs. Patterson, Teele & Dennis, and their certificate is made a part of this report.

THE OPERATING CONDITIONS.

The income statement reflects the improvement in business during the year. Freight revenues increased 11.97 per cent., passenger revenues 9.92 per cent., and total operating revenues 10.90 per cent. The gross operating revenues were the largest in the history of the Company. But, while this is gratifying, it must be observed on the other hand that the increase in total operating expenses during the year almost kept pace with the increase in revenues, being 9.91 per cent. The operating ratio, excluding taxes, was, however, 67.43 per cent., as compared with 68.04 per cent. last year, and 76.01 per cent. in 1907, the improvement in the three years being largely the result of the improved transportation conditions under the wage scale heretofore in effect. The property has been well maintained during the year and is in as good physical condition as is necessary, not only for the preservation of the integrity of the capital account, but also to make possible efficient operation. Insistent effort to increase efficiency in operation has been made, looking especially to maintaining a reasonable ratio between transportation expenses and gross revenue. The continued high cost of all the materials and supplies which a railroad consumes, and the increased cost of labor, without any proportionate increase in the selling price of the one thing the railroad produces and has for sale, viz., transportation, has so intensified the problem of successful railroad operation that the opportunity for good results is narrowed under existing conditions to efforts to increase the volume of business and improvement in operating efficiency.

Particular attention is invited to the General Manager's report for a statement of some of the most important results which have been accomplished during the year in those respects.

Late in the year general increases were made in the rates of pay of employees, which will have the effect of adding approximately \$2,000,000 to the annual pay roll of the Company.

THE CAPITAL ACCOUNT.

Important changes have taken place in the capital account during the year. The property investment has been increased \$14,061,558.29, of which \$3,923,593.70 was in road and \$10,137,964.59 was in equipment. The increase in the road account was due to additions made during the year, but the increase in the equipment account is largely a readjustment made necessary to better meet the requirements of the new uniform system of accounting prescribed by the Interstate Commerce Commission. There were, however, actual net additions to equipment during the year costing \$844,772.15.

Equipment obligations amounting to \$2,528,402.48 matured and were paid during the year. On April 1, 1910, a new equipment trust (Series N) was created, under which, equipment costing \$6,532,535 was contracted for, and new equipment obligations amounting to \$5,200,000 were issued and sold, the balance of cost being paid in cash. This increase in equipment obligations brought the total of such obligations outstanding on June 30, 1910, to \$18,208,791.84, which is \$2,368,695.13 less than the total of such obligations outstanding on June 30, 1907. In the three years since June 30, 1907, there have matured and been paid equipment obligations amounting in all to \$9,324,911.30, or more than the total of the new obligations now assumed. This reduction in the amount of contracted and fixed obligations for the purchase of equipment, which must be financed currently, and the necessity of additional engines and cars of large power and capacity to handle an increased volume of business with reasonable economy, were the justifications for the creation of the Equipment Trust, Series N.

THE FUNDED DEBT.

On January 1, 1910, there were drawn and taken into the Treasury \$5,000,000 of Development and General Mortgage bonds, which, under the terms of that mortgage, could be so drawn to reimburse the Treasury for its advances made for construction during the calendar year 1910. In like manner there were drawn and taken into the Treasury during the fiscal year \$1,766,000 of Development and General Mortgage bonds to reimburse the Treasury for the proportion of equipment obligations paid during the year, which, by the terms of the Development and General Mortgage, was to be charged to capital account.

By reason of these drawings the total amount of Development and General Mortgage bonds free in the Treasury on June 30, 1910, was \$7,536,000.

On November 1, 1909, the Three-Year Convertible Six Per Cent. Notes of 1911, amounting to \$11,105,000 were redeemed. These notes were the outstanding balance of the entire issue of \$15,000,000, which were called during the Spring of 1909, when the debt was permanently financed in the manner explained in the annual report for the year ended June 30, 1909.

On February 1, 1910, the \$15,000,000 of Three-Year Five Per Cent. Notes which were issued in 1907, matured and were redeemed. Of this debt \$5,000,000 was paid off in cash with treasury funds, and the balance was renewed by the creation and issue of \$10,000,000 of new Three-Year Five Per Cent. Notes, due February 1, 1913.

On January 1, 1910, there matured the three issues of bonds of the Atlanta and Charlotte Air Line Railway Company, amounting in the aggregate to \$5,500,000. These bonds had been extended from time to time in the past, and during the last three years had borne interest at the rate of 4½ per cent. The contract by which this Company operates the property of the Atlanta and Charlotte Air Line Railway Company provides for a perpetual right of possession and operation of that property, conditioned, among other things, upon the payment of the interest upon this bonded debt. Provision was accordingly made in the First Consolidated Mortgage for the acquisition of these bonds, and the maturity on January 1, 1910, was financed by the purchase of all the Atlanta and Charlotte Air Line Railway Company bonds, which were thereupon further extended at 4½ per cent. for ten years, or until January 1, 1920, and as so extended were pledged under the First Consolidated Mortgage against the issue and delivery of a like amount, at par, of First Consolidated Mortgage Five Per Cent. Bonds reserved in the custody of the Trustee for that purpose. \$5,000,000 of the First Consolidated Mortgage Five Per Cent. Bonds so issued, were sold at a price approximately sufficient to reimburse the Treasury for the cost of the acquisition of the \$5,500,000 Atlanta and Charlotte Air Line Railway Company bonds, thus leaving free in the Treasury of the Company \$500,000 of First Consolidated Mortgage Five Per Cent. Bonds.

On January 1, 1910, there matured the \$400,000 of First Mortgage Five Per Cent. Bonds of the Richmond, York River and Chesapeake Railroad Company. These underlying bonds upon property of this Company were redeemed with treasury funds, and a like amount of First Consolidated Mortgage Five Per Cent. Bonds which had been reserved in the custody of the Trustee against such redemption, were issued and taken into the Treasury.

On July 1, 1909, there matured the balance of \$282,500 of the Charlotte, Columbia and Augusta Railroad Company First Mortgage Five Per Cent. Bonds, Extended, which had not previously been acquired by this Company in exchange for First Consolidated Mortgage Five Per Cent. Bonds under the provision in that respect of the First Consolidated Mortgage. These matured bonds were redeemed by this Company with treasury funds, and there were issued and placed in the treasury to represent the disbursement a like amount of First Consolidated Mortgage Five Per Cent. Bonds.

By reason of these refunding operations and the sinking funds in respect of the underlying bonds upon the Charlottesville and Rapidan Railroad and the Franklin and Pittsylvania Railroad, there were taken into the treasury in all during the year First Consolidated Mortgage Five Per Cent. Bonds aggregating \$1,212,500, which, with the \$65,800 of such bonds previously held in the Treasury, amount to \$1,277,800 of Southern Railway First Consolidated Mortgage Five Per Cent. Bonds, which were free in the Treasury on June 30, 1910.

Advantage was taken of market conditions during the year to acquire a number of the underlying 6 per cent. bonds the maturity of which is approaching. These acquisitions were made by the issue in exchange on an agreed basis, of First Consolidated Mortgage Five Per Cent. Bonds reserved for that purpose. The underlying bonds so acquired and retired, with a consequent immediate saving in the interest charge, were:

Columbia and Greenville First 6s of 1916.....	\$27,000
Richmond and Danville Consolidated 6s of 1915.....	194,000
Virginia Midland Serial 6s of 1911.....	271,000
Western North Carolina Consolidated 6s of 1914....	56,000

The result of all of these financial operations in respect of the funded debt has been that, despite the accrual this year of a full year's interest on the \$41,333,000 of Development and General Mortgage bonds issued during the year ended June 30, 1909, the amount paid for interest on Funded Debt and Equipment Obligations was less in the year ended June 30, 1910, than in the previous year, as will be noted from the Income Statement.

The net increase of \$29,147.26 in the charges accrued during the year for Interest on Funded Debt, Equipment Obligations and Rents Accrued for Lease of other Roads, which items include all the Company's fixed charges was due to an arbitrary increase during the year of \$30,000 in the rental paid the Atlantic and Danville Railway Company under the provision of the lease made in 1899.

CONSTRUCTION.

No new construction of importance was undertaken during the year, but the work in progress as described in the last annual report has been prosecuted.

The benefit expected to be derived from the operation of the revised line through Lynchburg, Va., was postponed by a disastrous fire in the new tunnel while still incomplete and in charge of the contractor. This delayed the completion of the work beyond the time predicted, but it is now expected that the new double track line through Lynchburg from Monroe, Va., to Sycamore, Va., 38.14 miles, will all be in operation by this Fall.

The double track operated on the main line has been increased during the year by the completion of the second track between Spencer, N. C., and Concord, N. C., 24.07 miles; between Harrisburg, N. C., and North Charlotte, N. C., 8.27 miles, and north from Greensboro, N. C., 1.80 miles.

The heavy work on the 13.67 miles of revised line and double track between Citico, Tenn., and Ooltewah, Tenn. (the approach to Chattanooga, Tenn., from the east), has been prosecuted throughout the year and is nearing completion.

INDUSTRIAL PROGRESS.

There were 355 new industrial plants completed on the lines of this Company during the year ended June 30, 1910, classified as follows:

Brick Works	28
Cotton Seed Oil Mills.	21
Fertilizer Works	3
Flour and Feed Mills.	21
Furniture Factories	7
Iron Industries	21
Lumber Mills.	69
Stone Quarries, Coal and other Mines.....	30
Textile Mills.	36
Wood-working Plants	16
Miscellaneous Plants	103
Total	355

The number of industrial plants under construction at the close of the year was 72, and the number of additions made to existing plants during the year aggregated 163.

THE SERVICE OF EMPLOYEES.

It is proper to record, with appreciation, the industry, loyalty and efficiency of the officers and employees of all ranks during the year. The future success of the Company under existing economic conditions depends largely upon its relations with the public, who are its customers, and these relations depend largely upon two things which the officers and employees can and will and do give for the Company in ever increasing degree. These two things are Solicitation and Service. The Company has during the year met the expectation of its employees in respect of increased wages, because of the increased cost of their individual living, but in so doing it has heavily increased its own cost of living, and it relies upon its officers and employees to justify such increase by securing for the Company through proper relations with the public, effective solicitation and efficient service, such net revenue as will promote its welfare.

Respectfully submitted, by order of the Board,

W. W. FINLEY, President.

PROFIT AND LOSS ACCOUNT FOR YEAR ENDED JUNE 30, 1910.

Balance at Credit of this Account June 30, 1909.....	\$6,962,007.81
Add: Credit Balance of Income for the Year.....	5,704,645.70
	\$12,666,653.51
Deduct:	
Discount on Securities charged to Profit and	
Loss during the year	\$2,831,459.39
Tennessee Central Railroad Accounts written off	404,648.92
Net Miscellaneous Debits	744,584.79
	3,980,693.60
Credit Balance June 30, 1910.	\$8,685,959.91

INCOME ACCOUNT FOR YEAR ENDED JUNE 30, 1910, COMPARED WITH YEAR ENDED JUNE 30, 1909.

1909.		1910.
OPERATING REVENUES:		
\$34,376,619.13	Freight	\$38,161,391.93
13,510,791.49	Passenger	14,639,160.76
267,721.31	Miscellaneous Passenger-Train Revenue	279,092.78
1,495,202.44	Mail	1,375,681.64
1,491,643.68	Express	1,620,028.34
758,344.00	Other Transportation Revenue	845,782.71
287,784.59	Other Revenue from Operation.....	378,370.18
\$52,188,106.64	Total Operating Revenues.....	\$57,294,508.34
OPERATING EXPENSES:		
\$6,016,660.64	Maintenance of Way and Structures.....	\$6,635,724.58
8,198,753.44	Maintenance of Equipment	9,876,728.58
1,252,328.45	Traffic Expenses	1,436,776.24
18,348,507.08	Transportation Expenses	18,934,426.56
1,757,730.99	General Expenses	1,752,089.98
35,568,980.60	Total Operating Expenses.....	38,635,745.94
\$16,619,126.04	Net Operating Revenue	\$18,658,762.40
136,963.39	Outside Operations—Net Revenue.....	18,980.36
\$16,756,089.43	Net Revenue	\$18,677,742.76
1,916,701.65	Taxes Accrued (Federal Corporation Tax Excluded)	1,979,722.33
\$14,839,387.78	Operating Income.....	\$16,698,020.43

INCOME ACCOUNT FOR YEAR ENDED JUNE 30, 1910, COMPARED WITH YEAR ENDED JUNE 30, 1909.—(Continued.)

1909.		1910.
	OTHER INCOME:	
\$21,000.00	Rents Accrued from Lease of Road.....	\$15,499.98
	Hire of Equipment—Balance.....	149,345.71
199,185.80	Rents Accrued from Joint Tracks, Yards and Terminals	195,510.13
114,051.73	Miscellaneous Rents	135,016.29
	Miscellaneous Income	89,395.14
1,941,125.92	Income from Investments	1,999,138.71
622,948.25	Miscellaneous Interest and Commissions.....	595,229.76
2,898,311.70	Total Other Income	3,179,135.72
\$17,737,699.48	TOTAL GROSS INCOME.....	\$19,877,156.15
	DEDUCTIONS FROM TOTAL GROSS INCOME:	
	Southern Railway Company in Mississippi, Income from operation, Alabama State Line to Colum- bus, Miss.	\$31,958.56
\$1,351,504.00	Rents Accrued for Lease of Other Roads.....	1,381,504.00
769,094.52	Rents Accrued for Joint Tracks, Yards and Terminals	808,656.56
19,493.39	Hire of Equipment—Balance.....	
45,714.79	Miscellaneous Rents	60,993.80
81,463.71	Separately Operated Properties	116,462.04
535,214.44	Discount on Securities sold—Proportion charged to Income	266,806.19
	Federal Corporation Tax.....	47,382.02
31,290.36	Miscellaneous Deductions	92,688.26
2,833,775.21	Total	2,806,451.43
\$14,903,924.27	Total Available Income	\$17,070,704.72
\$10,376,016.21	Interest on Funded Debt	\$10,481,500.80
711,714.64	Interest on Equipment Obligations.....	605,377.31
226,808.00	Dividends Accrued on Southern Ry., Mobile & Ohio Stock Trust Certificates.....	226,808.00
11,314,538.85		11,312,686.11
\$8,589,385.42	Balance of Income over Charges	\$5,757,018.61
78,285.18	Additions and Betterments.....	52,372.91
\$3,511,100.24	Balance Carried to Credit of Profit and Loss for the Year	\$5,704,645.70

TRAFFIC STATISTICS FOR YEARS ENDED JUNE 30, 1910, AND 1909.

	1910.	1909.	Per Cent. of Increase or Decrease.
AVERAGE MILES OF ROAD OPERATED	7,050.17	7,030.38	Increase 0.28
PASSENGER TRAFFIC:			
Number of Passengers Carried	15,694,486	14,623,136	Increase 7.33
Number of Passengers Carried One Mile	671,732,143	615,252,906	Increase 9.18
Average Distance Hauled per Passenger (Miles).....	42.80	42.07	Increase 1.74
Total Revenue from Passengers.....	\$14,639,160.76	\$13,317,925.23	Increase 9.92
Average Receipts per Passenger per Mile (Cents).....	2.179	2.165	Increase 0.65
Total Passenger-Train Revenue	\$17,913,963.52	\$16,542,236.79	Increase 8.29
Passenger-Train Revenue per Mile of Road	\$2,540.93	\$2,352.97	Increase 7.99
Passenger-Train Revenue per Train Mile.....	\$1.14843	\$1.15689	Decrease 0.73
Average Number of Passengers in Each Train	43.06	43.03	Increase 0.07
*Average Number of Passengers in Each Car.....	13.42	13.73	Decrease 2.26
FREIGHT TRAFFIC:			
Revenue Freight:			
Number of Tons Carried	25,204,297	21,970,066	Increase 14.72
Number of Tons Carried One Mile.....	3,985,563,001	3,590,900,091	Increase 10.99
Average Distance Hauled per Ton (Miles)	158.13	163.45	Decrease 3.25
Total Freight-Train Revenue	\$38,161,391.92	\$34,081,052.51	Increase 11.97
Average Receipts per Ton per Mile (Cents).....	0.957	0.949	Increase 0.84
Freight-Train Revenue per Mile of Road	\$5,412.83	\$4,847.68	Increase 11.66
Freight-Train Revenue per Train Mile	\$2.27368	\$2.06047	Increase 10.35
Average Number of Tons of Freight in Each Train	237.46	217.10	Increase 8.00
Average Number of Tons of Freight in Each Loaded Car.....	14.53	14.19	Increase 2.39
All Freight (Including Company's Material Hauled Free):			
Number of Tons Carried	30,183,606	26,135,269	Increase 15.49
Number of Tons Carried One Mile	4,969,652,728	4,440,969,266	Increase 11.90
Average Number of Tons of Freight in Each Train.....	296.10	268.49	Increase 10.28
Average Number of Tons of Freight in Each Loaded Car.....	18.12	17.55	Increase 3.25
REVENUES AND OPERATING EXPENSES:			
Passenger and Freight-Train Revenue	\$56,075,355.45	\$50,623,289.30	Increase 10.77
Passenger and Freight-Train Revenue per Mile of Road.....	\$7,953.76	\$7,200.65	Increase 10.46
Gross Operating Revenue	\$57,294,508.34	\$51,661,579.44	Increase 10.90
Gross Operating Revenue per Mile of Road	\$8,126.68	\$7,348.33	Increase 10.59
Gross Operating Revenue per Revenue Train Mile.....	\$1.82991	\$1.73341	Increase 5.57
Operating Expenses (Taxes Excluded)	\$38,635,745.94	\$35,152,731.60	Increase 9.91
Operating Expenses per Mile of Road	\$5,480.11	\$5,000.12	Increase 9.60
Operating Expenses per Revenue Train Mile	\$1.23397	\$1.17949	Increase 4.62
Net Operating Revenue	\$18,658,762.40	\$16,508,847.84	Increase 13.02
Net Operating Revenue per Mile of Road	\$2,646.57	\$2,348.21	Increase 12.71
Net Operating Revenue per Revenue Train Mile.....	\$0.59594	\$0.55392	Increase 7.59

*Includes Sleeping, Parlor and Observation Cars.

COMPARATIVE BALANCE SHEET, JUNE 30, 1910, AND JUNE 30, 1909.

June 30, 1909.	ASSETS.	June 30, 1910.
	PROPERTY INVESTMENT:	
\$295,854,999.40	Road: Investment to July 1, 1909.....	\$295,854,999.40
	Additions during the year.....	3,923,593.70
\$46,330,776.20	Equipment: Investment to July 1, 1909.....	\$46,330,776.20
	Additions during the year.....	10,137,964.59
1,782,583.41		\$56,468,740.79
44,548,192.79	Less: Reserve for Accrued Depreciation on all equipment in service.....	12,050,132.83
		44,418,607.96
\$340,403,192.19	Total Net Road and Equipment.....	\$344,197,201.06
\$30,808,607.31	Leasehold Estates: Road.....	\$31,558,607.31
1,540,392.69	Equipment.....	1,540,392.69
32,349,000.00	Total Leasehold Estates (Per Contra).....	33,099,000.00
	Deposit with Trustee for the Purchase of Equipment, under Equipment Trust, Series N.....	5,797,848.03
\$372,752,192.19	Total Net Road, Equipment and Leasehold Estates.....	\$383,094,049.09
	COST OF SECURITIES PLEDGED OR HELD FOR SPECIAL PURPOSES:	
\$13,306,634.97	Pledged under First Consolidated Mortgage.....	\$18,806,636.97
20,296,872.21	Pledged under Development and General Mortgage.....	20,260,472.21
23,313,703.20	Pledged or deposited under Various Indentures.....	23,319,317.11
10,774,697.05	Unpledged, held for Special Purposes.....	6,872,508.78
67,691,907.43		69,258,935.07
11,105,000.00	Special Deposit with Financial Agent to Redeem on Nov. 1, 1909, Convertible Six Per Cent. Notes, due May 1, 1911.....	
	Southern Railway Development and General Mortgage Bonds.....	1,800,000.00
\$451,549,099.62	Total Net Road, Equipment and Securities Held as Stated.....	\$454,152,984.16
\$3,995,255.50	Material and Supplies on Hand.....	\$4,215,870.11
380,212.41	Rail and Fixtures Leased.....	391,513.51
4,375,467.91		4,607,383.62
\$455,924,567.53	TOTAL CAPITAL ASSETS.....	\$458,760,367.78
4,015,569.88	Miscellaneous Securities Owned—in Treasury Unpledged.....	4,061,052.94
595,479.68	Bills Receivable—deferred but secured.....	574,929.10
925,622.31	Advances to Subsidiary Companies.....	1,078,584.19
473,572.80	Income Accrued—not due.....	446,841.28
712.65	Insurance Paid—not accrued.....	807.73
620,659.19	Insurance Fund (Per Contra).....	700,610.56
500.00	Sinking Funds—Uninvested Balance in Hands of Trustee.....	
7,797,910.65	Net Discount on Securities Sold—to be charged off prior to maturity of the Securities.....	4,853,144.57
1,534,968.75	Sundry Accounts.....	1,153,696.52
	CURRENT ASSETS:	
\$11,124,664.97	Cash in hands of Treasurer, Banks and Financial Agents.....	\$8,728,256.71
1,117,014.74	Cash in Transit from Agencies.....	1,269,872.40
125,307.26	Due from United States Post Office Department.....	116,359.96
515,961.41	Due from Agents and Conductors.....	450,220.46
3,093,271.11	Due from Other Transportation Companies.....	2,973,420.75
966,652.53	Due from Individuals and Companies.....	1,047,014.34
583,064.56	Bills Receivable—current.....	602,085.14
824,300.00	Miscellaneous Current Securities.....	7,013,800.00
18,350,236.58		22,201,029.76
\$490,239,800.02		\$493,831,064.43

COMPARATIVE BALANCE SHEET, JUNE 30, 1910, AND JUNE 30, 1909.

June 30, 1909.	LIABILITIES.	June 30, 1910.
	CAPITAL STOCK:	
\$120,000,000.00	Common.....	\$120,000,000.00
60,000,000.00	Preferred.....	60,000,000.00
\$180,000,000.00	Total Capital Stock.....	\$180,000,000.00
5,670,200.00	SOUTHERN RY., MOBILE & OHIO STOCK TRUST CERTIFICATES.....	5,670,200.00
234,002,400.00	FUNDED DEBT	230,197,300.00
32,349,000.00	OUTSTANDING SECURITIES ON LEASEHOLD ESTATES (Per Contra).....	33,099,000.00
	EQUIPMENT OBLIGATIONS:	
\$229,000.00	Equipment Trust, Series C.....	
354,000.00	Equipment Trust, Series D.....	
1,617,000.00	Equipment Trust, Series E.....	\$1,323,000.00
35,550.00	Equipment Contract, Series F.....	
125,400.00	Equipment Contract, Series G.....	
2,700,000.00	Equipment Trust, Series H.....	2,250,000.00
1,820,000.00	Equipment Trust, Series K.....	1,540,000.00
7,200,000.00	Equipment Trust, Series L.....	6,600,000.00
	Equipment Trust, Series M.....	1,260,000.00
394,213.07	Equipment Trust, Series N.....	5,200,000.00
14,475,163.07	Miscellaneous Equipment Contracts.....	35,791.84
107,000.00		18,208,791.84
6,113.71	UNMATURED BALANCE OF PURCHASE PRICE, NORTHEASTERN RAILROAD OF GEORGIA.....	107,000.00
\$466,609,876.78	UNMATURED BALANCE ON HARTWELL, IND., BRANCH.....	6,113.71
	TOTAL CAPITAL, FUNDED AND LIEN LIABILITIES.....	\$467,288,405.55
	Reserves:	
\$161,783.96	For Maintenance of Way and Structures.....	\$122,320.64
108,049.04	For Maintenance of Equipment.....	127,223.24
78,788.65	Miscellaneous.....	77,145.78
348,621.65		326,689.66
1,988,435.89	Interest and Rents Accrued—not due.....	1,812,980.34
752,113.83	Taxes Accrued—not due.....	807,305.47
990,940.21	Unmatured Obligations for New Steel Rail.....	
620,659.19	Insurance Fund (Per Contra).....	700,610.56
265,472.15	Sundry Accounts.....	316,988.50
	CURRENT LIABILITIES:	
\$2,751,421.05	Interest and Rents Due and Unpaid, including amount due July 1.....	\$2,876,246.25
982,336.97	Bills Payable, including current obligations for new steel rail.....	1,724,536.25
100,955.25	Freight Claim Authorities Outstanding.....	91,028.97
1,825,752.61	Unpaid Wages, including June Pay-rolls.....	1,873,480.31
2,636,019.34	Audited Vouchers.....	2,866,538.40
852,008.93	Due Other Transportation Companies.....	1,161,828.04
288,914.95	Due Individuals and Companies.....	487,986.00
319,284.15	Material and Supplies in Transit—not vouchered.....	676,125.63
1,743,986.71	Undetermined Liabilities awaiting adjustment.....	1,880,989.13
11,500,679.96		13,638,758.93
200,992.55	APPROPRIATED SURPLUS—Additions to Property since June 30, 1907, through Income.....	253,365.46
6,962,007.81	PROFIT AND LOSS.....	8,685,959.91
\$490,239,800.02		\$493,831,064.43